

ECONOMIC CONSEQUENCES OF
FINANCIAL ACCOUNTING STANDARDS BOARD STATEMENT NUMBER 33:
AN INSIDER TRADING PERSPECTIVE

BY

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While most of the studies of Financial Accounting Standards Board Statement Number 33 have focused on the aggregate stock market reaction to the price level adjusted information mandated by this statement, this study examines the insider trading behavior of company managers during the periods when the managers had private access to firm specific price level effects on financial statements. During inflationary periods, the current cost or constant dollar adjusted net income is typically smaller than the traditional historical cost based net income. If the managers believe that this apparent shrinkage in income, when first disclosed publicly, would have an adverse impact on the firm's stock price, then they have an incentive to trade in their firm's stock. The primary hypothesis posits

that the managers of firms with a high degree of shrinkage in income would be net sellers of their firm's stock (on personal accounts) during the period just prior to the first public release of such information. Income shrinkage is measured primarily as the ratio of price level adjusted operating income to historical cost operating income.

Insider trading activity was analyzed during periods just preceding (1) the release of the exposure draft of Statement No. 33, (2) the first disclosure of supplemental information mandated by Statement No. 33, and (3) the first release of replacement cost information under the Securities and Exchange Commission's Accounting Series Release 190. Two control periods of trading activity (one before and one after the test periods) were used as comparison benchmarks. In addition to the income shrinkage ratio (adjusted for industry membership), the sample firms were partitioned on variables that allowed finer discrimination of the propensity of insider trading such as unexpected change in annual earnings, and the size and type of control of the firm.

For a sample of 485 firms, the results indicated that the primary hypothesis was clearly supported: the managers of firms expecting a high degree of income shrinkage were net sellers of their firm's securities during periods of private information possession. This was true for both Statement No. 33 information and ASR 190 information.

CHAPTER I INTRODUCTION

1.1 Motivation

In the past, much research has been done investigating the effects of changes in financial accounting standards. The accounting changes may affect the value of a firm directly through new information effects, or indirectly through impacts on management compensation contracts, debt covenants, intervention of regulators, etc. Many of the studies dealing with the effects of changes in accounting standards have focused on the aggregate security market reaction, with the maintained hypothesis of the existence of an efficient security market. If the security market is efficient in the semi strong form, it impounds the economic consequences of the change in the disclosed information in the price of stock. However, aggregate studies do not provide a view of individual behavior.

This study is about the Financial Accounting Standards Board (FASB) Statement No. 33 (Financial Reporting and Changing Prices) which requires that all publicly held companies with inventories, property, plant and equipment of at least \$125 million (or total assets exceeding a

billion dollars) furnish supplementary price level adjusted information in the financial statements, i.e., adjustment is required of net income and certain balance sheet items on a constant dollar basis and on a current cost basis.

The adoption of Statement of Financial Accounting Standard (SFAS) No. 33 by itself leads to the publication of finer information which was not generally available in such detail from the financial statements prepared prior to its implementation. The studies about the economic consequence or information content of SFAS No. 33 have basically assumed that the information produced is potentially useful and have tried to examine the impact of the standard on diverse financial policy and decision variables. They have used stock returns, analysts' forecasts, dividend policies, takeover targets, etc. as dependent variables of interest. The findings of the studies relating to stock returns have led to conflicting results and interpretations, most early studies concluding a "no new information" view, but a few recent ones contending that the stock prices (returns) reacted to the release of the information. Most of these studies were conducted at the aggregate security market level to address the effects of information coming out of SFAS No. 33 (or the earlier Securities and Exchange Commission [SEC] Accounting Series Release [ASR] 190) but did not examine the trading behavior of particular individual classes of

market agents (e.g., the insider-managers who are privy to the new information prior to its initial release).

In this study, the focus is on one important class of investors, the company "insiders," and their trading behavior related to the initial release of the finer price level adjusted information mandated by SFAS No. 33. Irrespective of the personal beliefs and expressed opinions of company managers as to lack of usefulness and reliability of SFAS No. 33 data (and ASR 190), the managers might not necessarily have assumed that the outsiders (i.e., the aggregate stock market) would indeed have ignored that the reported price level adjusted or "real" income numbers were significantly below their nominal income counterparts. Consistently with the managers' fixation on income (together with their skepticism of market efficiency), it is quite possible that managers might have assumed that investors would react negatively to the new information, especially when adjusted income is generally lower than the historical cost income, and drive stock price down. The effect of income shrinkage is the main focus in this study.

Given their belief that some negative price reaction might indeed occur (despite their public statements about the reliability of this new information), managers would have had the incentive to trade on their own account

and exploit their foreknowledge of SFAS No. 33 type information prior to its first publication.

Therefore, the objective of this dissertation is to study company managers' trading actions on personal account vis-a-vis their investment in the stocks of their own firms. Specifically, did the expectation of a shrinkage in the SFAS No. 33 current cost income (relative to historical cost income) lead to a net selling behavior on the part of insider-managers prior to the initial disclosures under SFAS No. 33?

A similar argument and hypothesis can be advanced about the partial replacement cost information that was made available through the SEC's ASR 190. Although not as a primary objective, this dissertation also examines the insider trading actions of company managers prior to the initial release of replacement cost information through ASR 190.

1.2 Evolution of Price Level Adjustment Disclosures

The events and related dates that are important for the purpose of analysis in this study follow. The first official step was the issuance of a discussion memorandum on Feb. 15, 1974, by the Financial Accounting Standards Board (FASB). On Dec. 31, 1974, the exposure draft "Financial Reporting in Units of General Purchasing Power" was issued by FASB. In Nov. 1975, the FASB decided not to

adopt the exposure draft issued in 1974 and finally in June, 1976, it withdrew the exposure draft.

Meanwhile on August 21, 1975, the SEC made its ASR 190 proposal. On March 23, 1976, ASR 190 was adopted. From March 31, 1977, first ASR 190 information became available.

On Dec. 28, 1978, the FASB issued another exposure draft entitled "Financial Reporting and Changing Prices." On March 2, 1979, a supplement was issued to the original exposure draft of 1974 entitled "Constant Dollar Accounting." FASB statement No. 33 became effective from Dec. 25, 1979, stipulating that certain qualifying (large) companies whose financial years ended on or after that date were required to furnish supplementary information regarding constant dollar restatement, while current cost information was mandated for financial years ending on or after Dec. 25, 1980.

1.3 Overview of Hypotheses

This dissertation analyzes the relationship between insider trading activity and the initial release of SFAS No. 33 data. During times of inflation, the current cost (CC) or constant dollar (CD) adjusted income would be typically lower than historical cost (HC) income. In order to capture this effect, i.e., relationship between the CC or CD (designated CC/CD) income and the HC income, a "Shrinkage Ratio" (shrinkage of CC/CD income in relation to

HC income) is defined as follows:

$$SR = 1 - \frac{IFCO\ CC/CD}{IFCO\ HC}$$

where IFCO = Income From Continuing Operations. Note: SR is defined such that larger values of SR signify greater shrinkage in income during inflationary times.

A higher shrinkage in income is expected to lead to a higher incidence of insider selling than buying by the insiders. In order to capture a net trading relationship between buying and selling, an Insider Trading Ratio (ITR) is defined as follows:

$$ITR = \frac{\text{Stock Sales}}{\text{Stock Sales} + \text{Purchases}}$$

The relationship between the SR and the ITR around information disclosure periods of interest is the main focus of this study, since the intent of this dissertation is to capture insiders' acts and not the effects of those acts. Trading activity or volume can capture the act. Price change or return is the effect. As the price effect captures several possibly conflicting beliefs and other events, it is considered not appropriate for the hypothesis of this study. Since insider trading has also been hypothesized to be affected by earnings forecasts and earnings announcements, the portfolios in this study are partitioned on the basis of favorable or unfavorable

"surprises" in the reported annual HC income to control for the existence of this possible concomitant independent variable. Also, in order to control for industry effect, the industry average of SR was used, and the portfolios were partitioned on the basis of the deviation of firm SR from the industry average.

Test period is defined as a period of six months immediately preceding the exposure draft for SFAS No. 33, first SFAS No. 33 information release, and six months preceding the first December 31 before the release of first ASR 190 information. Therefore for all the three events the test as well as control periods are between July 1 and December 31.

There are two control periods for both the exposure draft and first information of SFAS No. 33--one (three and four years, respectively) before the events and the other (3 and 2 years, respectively) after the events. However, ASR 190 information was tested only with one control period, i.e., one year before the release of ASR 190 information.

The primary hypothesis (H1) asserts that the insiders of high shrinkage firms would have been net sellers in the periods before the release of the exposure draft and first information of SFAS No. 33 and the ASR 190 information. The expectations in the same periods for the earnings change variable is that the insiders of those firms with

low earnings change would have been net sellers and vice versa.

It is of interest to introduce variables like firm size and type of control which are unique to different firms or industries and to test for those effects. This leads to finer partitioning of the primary hypothesis into sub-hypotheses H2 and H3.

The second hypothesis (H2) deals with size effect. Since smaller firms are not subject to as great scrutiny and control as large sized firms, this hypothesis asserts that the insiders of small firms would engage in greater net selling than the insiders of large firms.

The third hypothesis (H3) speaks to the control of a firm, i.e., the ownership effect. The difference between owner controlled firms and manager controlled firms arises because of the long run orientation and the identity of interests focused on the management of owner managed firms. This hypothesis posits that the insiders of manager controlled firms would engage in greater net selling than those of owner controlled firms.

1.4 Overview of Data and Results

The sample of firms used to test the hypotheses was drawn from the FASB Statement 33 Data Bank Version III (FASB, 1983). This data bank contains information from the Supplementary disclosures as required by the SFAS No. 33. These firms were compared with the Compustat Tape (Standard

& Poor's Compustat Services, Inc., 1985). The firms with negative HC income were eliminated due to problems with the definition of certain independent variable measures like the Shrinkage Ratio. Also utilities were eliminated because of industry peculiarities. After these eliminations the firms were matched with those in the SEC's (1982) Official Summary information on insider transactions which is now available in a computer readable form through the National Archives. The source of data on ownership information was collected from Value Line (Value Line Investment Survey, 1982).

The remainder of this dissertation is divided into five chapters. In Chapter II a review of the relevant research literature is presented. The main aim of the review of literature is to provide findings of the pre-SFAS No. 33 studies, the SFAS No. 33 studies, and insider trading and other related studies in order to build support for the primary hypothesis (H1) and the sub-hypotheses (H2 and H3).

Chapter III deals with hypotheses generation. A fundamental or primary hypothesis is formulated controlling for the earnings change ("surprise") variable with and without a control for the industry effect. The sub-hypotheses are developed as finer partitions of the primary hypothesis. Hypotheses H2 and H3 deal with the firm size and the ownership effects, respectively. Finally development of a supplementary analysis based on comments

by company managers to the SFAS No. 33 exposure draft is provided.

Chapter IV presents the experimental design and methodology used to test the hypotheses of this study. Following a detailed account of data collection, the variables of interest in this study are explicated in detail.

Chapter V presents the results of the statistical tests. A brief summary of the results follows (by order of hypotheses). The results for the primary hypothesis (H1) related to SFAS No. 33, disregarding industry effect, are in the expected direction, though for some test periods the attained significance is not strictly within the 10% level. However, the results are significant at conventional levels when control for industry effect is introduced. The results for ASR 190 are also in the expected direction signifying that the information introduced through the SEC's disclosures also appears to have provided an incentive for insider trading analogous to the first price level information released through SFAS No. 33. The earnings change variable in this analysis does not seem to have significant influence in the insider trading activity.

The findings of this research lend some support for the sub-hypothesis (H2) related to firm size based on total assets (and also sales). The insiders of small firms seem

to have been somewhat greater net sellers than those of large firms. Results based on ASR 190 tests are not much different from the SFAS No. 33 results.

Similarly, in the statistical tests relating to the ownership effect (H3) the results are satisfactory though not significant at conventional levels. Insiders of manager controlled firms appear to have marginally engaged in more net selling during the test periods than those of owner controlled firms. ASR 190 tests show significant results.

Chapter VI summarizes the overall study, results and findings and gives an account of the limitations of this study.

CHAPTER II REVIEW OF RESEARCH LITERATURE

This chapter is devoted to reviewing previous research about accounting for inflation (and changing prices) as well as insider trading studies. The results of the past research studies are presented as (1) pre-ASR 190 research, (2) ASR 190 analysis, (3) SFAS No. 33 studies, (4) insider trading (and stock market efficiency) and other related studies, and (5) indirect effects of accounting changes. The last section of this chapter relates this study to previous research about accounting for inflation and insider trading activity.

2.1 Pre-ASR 190 Research

Research relating to inflation data prior to mandatory disclosures was based on estimates of general price level adjusted (GPLA) data by agents external to the firm.

Hillison (1979) studied the association between unexpected reported earnings and security prices and compared this with the association between estimated GPLA earnings and security prices. He did not find significant association between GPLA earnings and security prices.

Baran et al. (1980) studied the degree of association of market beta (systematic risk) with accounting betas based on historical cost income variables versus those based on general price level adjusted (estimated) variables. The information content measure was defined as the degree of association between market beta and accounting beta. Their finding indicated that the association between market beta and GPL adjusted income based beta was significantly higher than the association between market beta and historical cost income based accounting beta. For the 18-year period examined in this study, GPL adjusted betas outperformed HC based betas in every comparison made. They indicated that their findings appear to suggest that in the absence of price-level data disclosure, investors attempt to adjust historical cost data to changes in the purchasing power of money and base their investment decisions on such restated data.

Sepe (1982) investigated the effect of the FASB's 1974-76 deliberations in the inflation accounting issue on security prices. He divided the test period into two segments, the initial proposal by the FASB requiring supplemental general price level adjusted financial information and the subsequent withdrawal of the proposal. Using three estimated (for GPL adjustment) accounting variables, his regression test showed that these accounting variables and the stock prices were

significantly correlated. He also tested to see if the correlation signs reversed between the two periods (i.e., initial proposal and withdrawal) and found that the signs indeed showed reversal as expected. His results appear to suggest that the GPL adjusted information had impact on stock prices.

Abdel-Khalik & McKeown (1978) evaluated the association between the disclosure of estimated replacement cost income and the changes in the market's evaluation of systematic risk measures. The three alternative hypotheses tested related to (1) the securities market's having already impounded the information, (2) the information content of replacement cost-data leading to security price revision, or (3) no information content and no revision of security prices.

The replacement cost data used were the forecast data estimated by Value Line and not the actual ASR 190 information. Their tests were based on systematic risk--both financial and operating risk measures. The findings indicated that the stock market's evaluations of financial and operating risk measures are inconsistent with the assertion that the replacement cost information is already impounded in security prices. They did not find significant shift in the market's imputed assessment of systematic risk after the disclosure of the estimates of the replacement cost income.

As stated in Chapter I, these studies lead only to inconclusive or conflicting inferences about the "information content issue" of the GPLA information.

2.2 ASR 190 Related Research

Accounting Series Release (ASR) 190 provides for rule 3-17, an amendment to Regulation S-X, and requires disclosures (in a footnote to the 10K report) of the replacement cost of inventories and productive capacity and depreciation expense and cost of goods sold computed under replacement cost.

Beaver et al. (1980), using 1975-77 data, found that the ASR 190 replacement cost disclosures provided no information to the market during the fifteen trading days both before and after the date the requirement was first proposed, the date the requirement became effective, and the date on which data were first filed with the SEC. They did not find any significant association between the security returns and the ASR 190 disclosures.

Gheyara and Boatsman (1980), using 1976 data, performed residual analysis. The results for their treatment sample showed a spiking effect 16 days prior to 10K report release whereas for the control firms (those not required to file supplementary replacement cost information) the effect is 2 days short. When they removed three firms from the treatment sample and three from the

control sample because of unusual nature they could not conclude that the 10K data introduced information for either the treatment or the control sample. Their analysis of cross-sectional return data reveals that the null hypothesis of "no information content" of 10K report cannot be rejected. They concluded that their tests suggest that the ASR 190 disclosures did not introduce new information during the 50 day trading period surrounding disclosures.

Ro (1981) investigated whether ASR 190 disclosures had any effect on weekly transaction volumes of common shares. He used five accounting ratio variables representing the effects of holding gains, the effects on capital structure, a return beta and a volume beta. Using a matched pairs (firms required to disclose versus those not required) design, he tested for volume difference over nine event periods for each of the variables. He found significant difference in volume only in a very few cases, leading him to conclude that ASR 190 disclosure had no effect on the volume of common stock shares traded.

In another study, Ro (1980) tested for the cost and information effects of ASR 190. The hypothesis that ASR 190 imposes an additional burden of the cost of compliance with the regulation on the affected firms was tested. The t-values for the events "adoption of ASR 190 and SAB 7" and "SAB 13" were significant. He concluded that one cannot reject the hypothesis that ASR 190 yielded benefits that

exceeded the costs. For the information effect test he used the same experimental design. He found significant difference in returns between "good news" and "bad news" firms. Also, he stated that the significant difference was due entirely to the negative abnormal returns of the bad news group. However, his nonparametric Wilcoxon matched pair signed rank test showed insignificant results. Overall, he concluded that at best only very weak evidence of the "information effect" exists.

Benston and Krasney's (1978) survey dealt with private placement loan officers, whose work involves negotiating bond purchases. The loan officers were presumably in a position to demand and receive the type of financial data from prospective borrowers which would be helpful in assessing the ability of the borrower to repay. The result of the survey indicates that the placement officers did not have much interest in the replacement cost data.

Similarly, the Booze-Allen and Hamilton (1978) survey reveals that less than 1% of the financial analysts actually altered their decisions on the basis of ASR 190 data. The O'Connor and Chandra (1978) survey reveals that financial analysts were unimpressed with the replacement cost data mandated by ASR 190.

2.3 SFAS No. 33 Studies

The information content analysis of SFAS No. 33 has been studied relative to stock returns, analysts' forecasts, dividend policies, takeover targets, etc. The studies reviewed below are by no means exhaustive, but the ones chosen include those that are important and/or representative of the work done in this area.

Noreen and Sepe (1981) adopted a methodology which did not require exact specification of the direction or magnitude of the price reaction for individual firms. Their study used "abnormal" stock returns during three event periods relating to mandatory disclosures (the Jan. 1974 first FASB agenda, the Nov. 1975 postponement of inflation accounting, and the Jan. 1979 exposure draft of SFAS No. 33), and on the basis of correlations between the three sets of data (being negative), they concluded that the evidence supported the hypothesis that the FASB policy deliberations had an impact on share prices on at least two of the three occasions. There was stock market reaction in the months in which deliberations were announced in the Wall Street Journal.

"The ability of earnings adjusted for changing prices to explain stock price changes relative to the explanatory power of historical cost data"--was the focus of the study by Beaver and Landsman (1983, p. 6). They investigated the association between the stock price changes and the

accounting variables based both on HC as well as CC/CD income. They tested a two-stage regression model, the second stage eliminating the correlation between the HC income and the CC/CD income. In their first stage regressions for 1979 through 1981, they reported significant correlation between statement 33 variables and historical cost earnings. In their second stage regression, the t-value on the regression coefficient for historical cost income is positive and significant meaning significant association between price changes and HC incomes. However, the coefficient on non-historical cost earnings (i.e., CC/CD income) variable (uncorrelated with historical cost) varies considerably. From these results they concluded that the "explanatory power of historical cost is clear-cut, the incremental explanatory power of statement 33 data is not" (p. 63). Their findings were similar in their cross sectional valuation level tests leading to the conclusion that Statement No. 33 earnings appear to provide little or no incremental explanatory power. Statement no. 33 earnings act as if they are a garbled version of HC earnings.

Publitz et al. (1984) replicated the Beaver and Landsman study with a different (stepwise regression) methodology to overcome what they claimed were measurement problems in the Beaver and Landsman study. Applying their methodology to ASR 190 data, they concluded that the

disclosures provided little or no explanatory power beyond that provided by historical cost earnings. However, the results for 1980 and 1981 indicated highly significant incremental explanatory power for the SFAS No. 33 variables. Their study, unfortunately, fails to show consistent findings for any given SFAS No. 33 variable from year to year.

The Freeman (1983) study offered explanation for the lack of observed market reaction (as reported by Beaver et al., 1980) to the current cost data. The relationship between current cost earnings and the GAAP earnings is intraindustry homogeneous, rather than firm-specific. Industry-wide trends in prices are relatively easy to forecast with nonaccounting data because they are closely monitored. The empirical model used in his study regresses "abnormal returns" on three independent variables (industry-specific GAAP earnings component, industry-specific current cost earnings, and firm-specific component of the GAAP earnings) at three possible annual leads/lags. His results indicated that an industry-wide trend in GAAP profits is reflected in security prices earlier than the firm-specific deviation from the industry average. Also, industry-wide trends in current cost profits are anticipated equally early. His results are consistent with the notion that security returns are correlated with current costs and sales prices.

Evans and Freeman (1983) made an analysis of current cost income data for 500 nonfinancial companies and compared it with the conventional measures. For the period 1979-1981, profits based on historical cost increased while current cost profits stagnated or decreased. This indicates that current cost/constant dollar data might convey potential information about the effect of inflation. They found the rankings of ROI ratios based on HC and CC/CD income to be fluctuating and concluded that the effects of inflation are unique on firms and industries and that these are not conveyed in the primary financial statements.

Bar Yosef and Lev (1983) tested for the association between dividend changes and eight measures of earnings (historical cost [reported] earnings, cash flow, and six measures of current cost/constant dollar earnings). Their ranking of firms on the basis of historical cost earnings explained the dividend changes better than the rankings (within each subgroup) based on inflation adjusted variables. Their regression analysis also showed good correlation between dividend changes and historical cost earnings variables. Also, in their second stage regression analysis where they incorporated an "incremental information" variable, i.e., a variable uncorrelated with the historical cost earnings, their results did not change. Therefore they concluded that the price adjusted

data under SFAS No. 33 did not appear to have affected the firm's dividend decisions.

Dharan (1984) tested for the relationship between the dividend decisions and the accounting variables (both HC and CC/CD incomes). He computed three performance ratios for four categories of firms based on the direction of change in historical cost and current cost/constant dollar income. His tests indicated that historical cost income measures are informative with respect to identifying firms that have superior performance ratios. A similar conclusion was made with respect to current cost measures (but not constant dollar measures). The five portfolios of his study exhibited strong differential behavior with respect to the three performance ratios. The firms with low current cost or constant dollar/historical cost ratios had the worst performance ratios. Also such firms had higher payout and yield ratios. If the SFAS No. 33 has information content with respect to changes in dividend decisions, one would not expect such a trend.

Norby (1983) studied the use of SFAS No. 33 adjusted data by investment analysts. One investment analyst company in its model used discounted cash flow adjusted for inflation rate. The same company used SFAS No. 33 data to develop cash flow projections but found little client interest in such data. Another investment analyst company used current cost data in developing dividend model but did

not find significant difference in rankings between historical cost and current cost dividend models. Overall, the study reported lack of interest in the CC/CD income and its use by the investment analysts and their clients in various financial decisions.

The various studies cited above have conflicting results and inferences pertaining to the information content issue of SFAS No. 33. The market-based studies relied to a great extent on the belief of the existence of efficient security market in a semi-strong sense.

The stock market studies (the related area of interest in this research) tested in general for the relationship between the stock returns and the CC/CD income variables (as well as HC income variables). Such a test was based on the assumption of the existence of efficient stock market in a semi-strong sense. However, as the belief by insiders about market efficiency is not strong as seen by Mayer-Sommer (1979), there is another possibility of testing the information content of SFAS No. 33 through insider trading. If the company insiders perceive that the CC/CD information would have unfavorable effect on the stock price (because of "shrinkage" in income), it is in their self interest to sell their stock in anticipation of the market reaction.

2.4 Insider Trading (and Stock Market Efficiency) and Other Related Studies

Jaffe (1974) examined three different sets of samples to test if insiders possessed special information and if they earned profits by trading on their own accounts on the basis of their private information. His tests based on cumulative average residuals for one, two and eight months holding periods indicated successful trading by insiders. As the number of insiders increase, the nature of information becomes almost public through leaks or common assessment of generally available information. When transaction costs were included for the eight month holding period case, he was able to show that insiders earned approximately 3 percent profits. To test for information content of the SEC's Official Summary, he computed abnormal returns subsequent to the Official Summary's publication dates and found them to be significant suggesting there was ☒ information content in the public data. The findings of Jaffe are inconsistent with the findings of "efficient market" studies based on semi-strong form. He indicated that trading on inside information is widespread.

Finnerty (1976b) investigated insider trading activity for the period January 1969 to December 1972 also using the SEC's Official Summary data. He used market model residuals on the entire population of insiders (instead of the "intensive" insider trading used by Jaffe) so that the results could be used to evaluate the performance of an

average insider. His monthly excess returns for the "buy" portfolios were positive and significant implying that insiders earned above average returns. Similarly, for "sell" portfolios, excess monthly returns were negative and significant (except for two months) implying that insiders can outperform the market in their stock selections. For the "buy" portfolio, most of the above average returns were realized during the first six months, and the first month had the greatest amount of above average return, which indicates that during subsequent months the information becomes public knowledge and return is discounted quickly by the market.

Finnerty (1976a) used factor analysis and multiple discriminant analysis to search for the existence of relationships between insiders' trading and subsequent announcements of financial and accounting results. He concluded that the insider assesses the undervaluation or overvaluation of his corporation's securities by the market according to the way he expects a particular piece of information to affect the future market price of those securities. The insiders who had decided to buy were purchasing the securities of companies distinguished by smaller size, larger earnings and larger dividends compared to those companies whose securities the average insiders were selling.

Baesel and Stein (1979) tested Canadian data from stocks of the Toronto Stock Exchange for the period January 1968 to December 1972 and used two subgroups of insiders--ordinary insiders and bank directors. The cumulative average residuals for one to twelve month holding periods were nearly zero for the control sample while at the end of twelve months the returns were 7.8% for bank directors and 3.8% for ordinary insiders. Their statistical tests on the normalized residuals reveal that bank directors did better than ordinary insiders and that the insiders overall did better than the control sample. To test if the gains disappeared in the month after the trade, they tested the unusual profits over a one-to-two month holding periods and found that the unusual returns occurred smoothly and that most of the unusual profits did not occur until several months after the trade. This latter finding also contradicts the semi-strong form of the efficient market hypothesis.

2.5 Insider Trading and Accounting Information

Larcker, Rader and Simon (1983) analyzed insider trading to test if firms are affected by mandated accounting changes. They focused upon the SFAS No. 19 exposure draft (accounting for oil and gas) released on July 18, 1977 which required the successful efforts (SE) method of accounting for exploratory oil and gas drilling

costs. They compared the stock trading activities of the 37 SE firms' insiders with those of the full cost (FC) firms' insiders in the periods immediately preceding and following the exposure draft and a year before the exposure draft. They found statistically significant differences in the trading activities between the two groups during the five periods of their study. FC insiders were selling relatively to the behavior of SE insiders. Their within sample test, i.e., comparing FC (or SE) insider behavior to the historical FC (SE) insider behavior, reveals that the FC insiders were selling in the period after the exposure draft and that the SE insiders were buying (selling) in the period after (before) exposure draft. To test whether the insider activity was associated with profit making, they ran Spearman rank correlation between the insider trading activity and the raw returns data for the two days after the exposure draft. Though the sign of correlation was consistent with profit making, it was not statistically significant. Their study also tested for additional price adjustment immediately after the initial price adjustment due to the exposure draft. To test for such an effect they ran a correlation between the raw return and net insider trading for a 3 day period after the day of the exposure draft but did not find post-exposure draft price adjustment. One of the possible interpretations of their findings is that the FC insiders might have perceived the

FASB Statement No. 19 to be associated with adverse economic consequences for their firms.

Abdel-Khalik, Ajinkya and Smith (1984) evaluated managers' knowledge and use of private information as an incentive for voluntary dissemination and the timing of the release of accounting information (specifically, earnings forecasts by managers). This study evaluated the performance of several trading strategies utilizing insiders' knowledge of the predicted EPS prior to making it public as a management forecast. The unexpected portion of EPS forecasts is measured as the difference between the management forecast and the most current analyst forecast. Results indicated that profitable trading strategy was to purchase (or sell) shares before disclosing favorable (or unfavorable) news and sell (or purchase) before disclosing unfavorable (or favorable) news. Their dominant trading activity measure was the ratio of number of shares sold to number of shares traded. On this basis, the insider activity was divided into sales or purchases. Each trading activity was classified either as legal or illegal depending on the likelihood that the managers exploited their knowledge of forecasts or timed their forecast release so that it would make their trading profitable.

Profitable trading activity was observed when favorable earnings forecast were followed by insiders'

purchase. However, results of Abdel-Khalik et al. (1984) do not support use of selling activity as a profit making strategy. The conclusion of their study was that the information content of the EPS predictions dominates the one based on signals provided by trading activity.

Almost all of the above studies conclude that insiders are successful in earning profits by trading in their own stocks. The findings of these studies to a great extent are inconsistent with the notion of market efficiency in the strong form and to some extent the semi-strong form, i.e., it takes more time for the market to capture the available information before reflecting a change in price.

The Mayer-Sommer (1979) survey reports on the levels of understanding and acceptance by corporate insiders of the efficient market hypothesis (EMH) in each of its three forms: weak, semi-strong and strong. Two groups of respondents, accounting information preparers (controllers of Fortune 500 corporations, academicians and CPAs) and users (chartered financial analysts), were surveyed. Each respondent provided information about his understanding of the EMH, his awareness of the accounting implications of the semi-strong and strong forms, and his acceptance of the EMH research findings about market efficiency in the weak, semi-strong and strong forms.

The results regarding the understanding of EMH indicate that Fortune 500 Controllers and Big 8 Partners

(accounting information preparers) showed a greater lack of understanding of the EMH in any of its three forms. One finding indicates that almost two-thirds of the preparers did not understand the EMH in any of its three forms. Only a fourth of the controllers (i.e., company insiders) showed understanding of the EMH in all of its three forms while a similar figure for users was 44%.

The results about the acceptance of EMH by the respondents are also of interest. At a reasonable level of statistical cut-off, the author found none of the Fortune 500 controllers (insiders) accepted the EMH in all its three forms. He could find only 8% of the insiders accepting only the weak form. Results were similar for the Big 8 Partners. The interesting finding of his study is that there is the denial of semi-strong form of efficiency by the corporate insiders. Over 90% of the controllers thought that financial reports of the NYSE listed firms were useful in identifying over- or under-valued securities. Also, fewer company insiders than users (outsiders) of accounting information thought that accounting-determined risk measures were highly associated with the market-determined risk measures.

The findings of the Mayer-Sommer study provide an alternative criterion to study the economic consequences of changes in accounting disclosures. Given their skepticism about market efficiency at the semi-strong level, one can

study the actions (trading in the stock of their own companies) taken by insiders as they try to second guess the impact of the accounting change on stock market reaction (whatever be the actual direction and level of that reaction). This dissertation uses insider's stock trading actions as the criterion variable of interest.

Though the managers may not believe in the efficiency of stock market, that is not sufficient condition for the prevalence of insider trading. The tenets of agency theory tell us that there are obstacles to insider trading. Having this in mind a review of the papers by Fama (1980) and Hakansson (1981) is done.

Fama (1980) argues that "for the purposes of the managerial labor market, the previous associations of a manager with success and failure are information about his talents. The manager may not suffer immediate gain or loss in current wages from current performance of his team, but the success or failure of the team impacts his future wages and this gives the manager a stake in the success of the team."

The firm security holders provide important but indirect assistance to the managerial labor market in its task of valuing the firm's management. The security holder is willing to pay the price that reflects the risk he is taking. Although the individual security holder may not have direct control over the management, he has a strong

interest in the existence and maintenance of a capital market which efficiently prices the firm's securities. The signals provided by the security market about the value of the firm's securities are important for the managerial labor market's re-evaluations of the firm's management.

The external managerial labor market exerts many direct pressures on the firm to sort and compensate managers according to performance. When a firm's reward system is not responsive to performance, the firm loses its managers. There is also much internal monitoring of managers by other managers. In the view of "nexus of contrasts" each manager is concerned with the performance of managers above and below him since his marginal product is likely to be a positive function of theirs. All managers realize that the managerial labor market uses the overall performance of the firm to determine each manager's outside opportunity wage.

He argues the case for incorporating ex-post settling up (on an ex-ante contract) of managerial remuneration to attain optimal control particularly with respect to managers' consumption on the job in the form of perquisites. The managerial labor market plays a crucial role in his model to monitor the actions of the manager. According to the assumptions of Fama's analysis, if the manager trades on the basis of private information and makes profit, the managerial labor market is not going to

view it favorably. His remuneration in his next job would be adjusted (i.e., lowered) for the gains he made from trading on the insider information.

One important question raised by Fama himself is if the managerial labor market is indeed competitive. This is obviously an empirical issue. The question of interest here is whether the gain made by managers is so significant from the firm perspective that the stock holders will effectively penalize the manager.

One can see thousands of insider trading events reported in the SEC's Official Summary every month. While some of them may be in contravention of existing laws, only relatively infrequently do we see insider trading activity being investigated by the SEC (usually when transaction is large). Therefore, there may not exist effective expost settling up and insiders may continue to engage in trading based on private information.

Hakansson (1981) analyzed the "politics of Accounting Disclosures." In his model he employed the management, information searchers, investors subscribing for information and non-subscribing investors as participants in the disclosure issue. He considered "laissez faire" versus "timely disclosure" situations. Under the laissez faire situation he was able to show that subscribing investors would tend to be wealthier than the

nonsubscribers. The effect of knowing more than others helps one improve his welfare at the expense of others.

Under the timely disclosure situation, the management was worse off than under the laissez faire case. Nonsubscribing investors were better off than before. The searchers of information were worse off.

He analyzed the outcome of the regulatory conflict and came out with a situation wherein the small investor group was successful in getting new and costly disclosures imposed but completely ineffective in that the information either was null or arrived too late. "An example of this type would be the current insider trading disclosure requirements."

Overall, timely disclosure may increase the value of a firm but it is not feasible from a practical standpoint. In the context of this dissertation, it is not in the self-interest of the manager to make all the minute details about the shrinkage in CC/CD income available to the stock market participants as he knows it. There is a time lag between the time he knows the information and the time the market knows. This time lag is helpful for the insiders to trade on their own account especially if the probability of being penalized is not very high.

2.6 Indirect Effects of Accounting Changes

The indirect effects of an accounting change which is cosmetic not having direct economic consequence have been researched in the past. Though the change is merely accounting in nature (i.e., no cash flow effect), it has been found to affect the value of a firm (because of debt covenant or incentive or political effect). In the present context, i.e., CC/CD disclosures, it can be said that these disclosures may eventually lead to the incentive or debt covenant effect.

The debt covenant effect of an accounting change is that the change affects the firm's investment, financing and production pattern if the debt covenants are based upon reported accounting numbers (Smith & Warner, 1979; Leftwich, 1981; Holthausen, 1981). It has also been argued that an accounting change which affects the reported income may cause technical violation of debt covenant and subsequent renegotiation of debt agreements at a higher rate (Smith & Warner, 1979; Collins et al., 1981). It is likely that the insiders of a firm know more about any technical violation of a covenant and the cost of renegotiating the debt better than the other market participants. SFAS No. 33 Exposure draft does not require altering the reported accounting figures. As such, technical violation of covenants does not seem to occur. However, when supplementary information is provided, the

bondholders may compare the figures and ratios calculated on the basis of supplementary information with those of the historical cost figures and may feel that the provisions in the covenants can be improved to their advantage by using the supplementary information, particularly the bonds which are in the process of being renegotiated after the SFAS No. 33 information being made available to the holders. The bondholders may want the new ratios to be incorporated in the covenants which may affect the value of the firm. Insiders may very well know all the specific details affecting the value of the firm well in advance of others.

The incentive effect (Watts & Zimmerman, 1978; Collins et al., 1981) refers to the consequences of an accounting change because of remuneration based on reported income. The managers whose remuneration is based upon reported income may alter the business plans to achieve a desired compensation. The corporate insiders may have more information about the details of incentives offered to managers than other market participants. Here again, if the incentive is linked to the reported income, the stockholders may want the remuneration to be based on the current cost/constant dollar income which is more realistic than the historical cost income. Managers (insiders) can perceive the consequences of the supplementary information well in advance of others.

If the managers anticipate the stock market to view SFAS No. 33 disclosures as affecting the value of the firm negatively (via incentive or debt covenant effect), then they have incentives to sell their stocks in anticipation of a negative stock market reaction.

2.7 Relationship of Reviewed Studies to This Research

The stock market studies relating to SFAS No. 33 (and ASR 190) defined information content as the relationship between the CC/CD income variables and stock returns. Most of the early studies did not find significant incremental relationship between the inflation or specific price level adjusted accounting data and stock prices. The conclusion drawn from the results of these studies was that there was either no information content or that the security price had already impounded the information or that enough learning (how to use the new data) had not taken place.

The stock price reflects aggregation of information. The stock market is composed of a number of segments like large investors, insiders, institutional investors, small investors, one time investors, analysts, etc. Some sections of the investors might have perceived the SFAS No. 33 information to be useful while others might have cast doubt about its usefulness or reliability; so that at the end, at an aggregate level one might not have observed a significant impact of the Statement 33 on the stock price.

Therefore, in the present context it is proposed to isolate a particular market segment (the insider-managers) and analyze their reaction (trading in the stock of their own firms) to the SFAS No. 33 information. This segment is very important because the company insiders are privy to the information produced and released and are the first to possess such information. Also it is reasonable to assume that they are knowledgeable about their firm and results. Their reaction to the information constitutes an alternate way of studying the economic consequence issue.

Almost all the insider trading studies lead to the view that the insiders possess private information and presumably use such information for their personal gain. The obvious motive is self interest. Also, studies reveal that the stock market is not efficient in the strong sense, which is a necessary condition for trading by insiders to be successful. The important issue in the present context is the perception of stock market efficiency rather than the efficiency per se. As revealed by the Mayer-Sommer survey, many of the insiders do not understand or accept the concept of market efficiency. This implies that they have the incentive to trade on the basis of information (pertaining to changes in accounting disclosures) that they hold privately for some time prior to the public release, expecting the market to react to the disclosure only some time after the public release.

There are incentives for management not to make timely disclosures of information as analyzed by Hakansson (1981). Though such a disclosure would increase the value of a firm, it is not in the manager's personal interest to reveal the information in a timely fashion, thus allowing him the opportunity to trade.

The market for managers may not be competitive. If it is competitive, then it would act as a deterrent for insider trading. Even if the market is competitive, it may be that the gain from insider trading may not be significant from the point of view of the company and may be considered by the stock holders as a part of the managerial remuneration.

In short, there are motives and incentives for insider trading and the SFAS No. 33 led to production and publication of finer information the details of which were known to insiders prior to its first release. This provided them with the opportunity to engage in insider trading.

The next chapter relates to the hypotheses tested in this study.

CHAPTER III HYPOTHESES

3.1 Background Conditions

Inflation information that might possibly have been impounded in stock prices at the time of release of the exposure draft of SFAS No. 33 and its implementation was primarily that from ASR 190 replacement cost disclosures as required by the SEC as well as from other privately produced information on industries and individual firms by analysts. However, SFAS No. 33 data is a more comprehensive information set giving the impact of general inflation as well as changes in specific prices on reported net income. As a result, one can expect various decision makers to react to SFAS No. 33 disclosures in an incremental manner, that is, SFAS No. 33 disclosures are presumed to have information content relative to the earlier and partial ASR 190 disclosures. Insiders are in a position to know all the specific details of the effect of SFAS No. 33 (before it is disclosed for the first time) on reported income and can predict the extent of shrinkage in income (i.e., current cost income relative to historical cost income) to a greater precision and therefore the direction of the hypothesized movement in stock prices.

The results of the studies (Jaffe, 1974; Finnerty, 1976a and b; etc.) dealing with insider trading lead to the view that insiders possess and presumably use private information to earn abnormal profits by trading on their own stock. Also, insider trading activity has been used (Penman, 1982; Larcker et al., 1983; Abdel-Khalik et al., 1984) to test whether possession of new accounting information by insiders is associated with their trading activity. These studies concluded that the company insiders are successful in profiting from trading on their own stock. Moreover, the perception of loose monitoring and sanctions against insider trading supports the contention of possible insider use of private information for personal gain. It is assumed that the insider managers who have access to unique information (not immediately available to the other market participants) will generally use such information for their personal benefit.

As per the survey of Mayer-Sommer (1979), the managers who admit not to generally understand and/or accept the EMH, certainly cannot be expected to believe that the outsiders can get a detailed and precise picture of the "real" (as contrasted with the "nominal" or historical cost) profitability of the firm through information either guessed at or compiled by sources external to the firm. Hence, even more remote (in view of the insider-manager) is the possibility that the detailed firm-specific information

is already reflected in prices in an unbiased manner. Thus, one would expect that the insider-manager would anticipate a stock market reaction when new information (via SFAS No. 33) pertaining to the real (price level adjusted) profitability of the firm is made available to market participants. Given the anticipation of the price reaction and a presumed foreknowledge of the insider about the extent of the divergence between "nominal" and "real" profits, there arises the motivation to engage in insider trading prior to the first revelation of detailed firm-specific price level information. Since the estimate of real income (reported as per SFAS No. 33) will typically be smaller than the nominal income during inflationary times, it is expected that the insiders, given their beliefs, would engage in net selling (buying) if the income shrinkage (i.e., complement of the ratio of current cost income to the historical cost income) expected to be reported for the first time is relatively high (low).

The "first time" location is unclear and may be associated with two (either or both) alternate disclosure requirements pertaining to current cost data: (1) the limited ASR 190 replacement cost disclosures which were mandated by the SEC in 1976 and (2) the more comprehensive SFAS No. 33 current cost and constant dollar disclosures mandated by the FASB effective since 1979. The primary focus of the current research is on the initial SFAS No. 33

disclosures, even though the initial ASR 190 disclosure period will also be tested for completeness.

The dates that are of interest in this study pertain to the issuance of the exposure draft (Dec., 1978), the publication of the first supplementary information in accordance with FASB Statement no. 33 (Jan.-March, 1980), and the first ASR 190 information release (March, 1977). Insider trading during periods not affected by the new information will serve as control benchmarks.

Prior studies show that certain firm and industry characteristics (like firm size, type of management, etc.) affect the financial decisions relating to a firm. Based on those characteristics and using the shrinkage in income it can be argued that the insiders of small size or owner managed firms will be net sellers if the shrinkage in income is higher. A description of the primary hypothesis (H1) and finer partitions of H1 into two sub-hypotheses (H2 and H3) based on variables like firm size and type of control is given below.

3.2 Primary Hypothesis

In addition to the arguments in the previous section, the short run orientation of many managers may not deter them (inspite of the SEC's proscription) from engaging in insider trading activity based on private knowledge. Although "timely" disclosure of relevant information is

Pareto optimal and leads to an increase in the value of the firm (Hakansson, 1981), it is not in the manager's self-interest to let others know immediately (as soon as he knows) all the details about the expected shrinkage in reported income. Thus, managers may prefer to act on the information which is not yet publicly available. Based on these arguments, the following primary hypothesis is formed:

- H1: The companies which are expected to report for the first time a relatively low current cost income as per SFAS No. 33 (compared to historical cost income) would experience net insider selling (i.e., higher the income shrinkage, greater the net selling).

Note that the primary hypothesis H1 as well as the sub-hypotheses H2 and H3 will be tested during three time periods: (1) those associated with first release of information under ASR 190, (2) the exposure draft for SFAS No. 33, and (3) first release of information under SFAS No. 33.

3.3 Size Effect

Prior research about the relationship between earnings reports and security price behavior reveals that a significant portion of the information revealed through earnings reports is already reflected in security prices

prior to the report month. This "leakage" is attributed to more timely sources of information which enable the market participants to forecast earnings prior to their formal release.

The amount of "surprise" remaining at the time of formal report release is inversely related to the intensity of private search activities concentrated on the firm by market participants. An efficient proxy for predisclosure private search is firm size. Thus the measured market reaction (whether volume of trading or returns) is seen to be inversely proportional to firm size. Atiase (1985) and others provide corroborating evidence on the inverse relationship between firm size and the abnormal returns associated with earnings announcements.

The argument given above leads to the view that there are greater opportunities for profit making from trading in the stocks of a small firm than that of a large firm, since more information about the latter is likely to be in the public domain. Also, the probability of leakage of inside information could be argued to be higher in a large firm than in a small firm by virtue of its uncontrollability due to largeness. As such, insiders of small firms are in a better position to make profit and hence have greater incentives for trading in their own stock than those of large companies. These arguments lead to the following sub-hypothesis:

H2: Given equal levels of income shrinkage, the insiders of small companies would engage in greater net selling than those of large companies.

3.4 Ownership Effect

Smith (1976) and others analyzed whether the separation of ownership from control produces different accounting method choice behavior. Specifically, he addressed the question whether manager-controlled firms were more likely than owner-controlled firms to use accounting policy decisions to direct income toward various income targets and found support for the type-of-control effect, i.e., manager controlled firms tend to apply the concept of smoothing in reporting income more often than owner controlled firms because it is in the self interest of the manager (in manager controlled firms) to avoid variability in the reported income.

This study also explores the question of whether separation of ownership from control leads to analogous behavior in the case of insider trading. The firms in this study can be divided into owner controlled and manager controlled depending upon the percentage of shares held by insiders. In the owner controlled firms, the management has more of a long run interest imposed on it by virtue of substantial financial commitment and long range horizon of

the controlling owners. Therefore, owner-managers may not be as inclined in trading on their own account as non-owner managers. If the owners sell some of their stock in the interest of short-run profit making on insider trades, this may lead to a reduction in their voting rights and ultimately a loss of control. This would limit insider managers from selling their stocks. Also, the manager of an owner controlled firm is answerable to the owners which may serve as a constraint on the trading activity of the manager, while such a constraint is less likely in a manager controlled firm. Based on these arguments, the following sub-hypothesis is advanced:

- H3: For equal levels of income shrinkage, insiders of manager controlled firms would engage in greater net selling than those of owner controlled firms.

3.5 Supplementary Analysis

Prior studies about inflation (and/or changing prices) information assumed that the information was potentially useful and tested for the information content of such disclosures particularly with reference to SFAS No. 33 (and ASR 190). Contrary to the popular assumption and belief that the SFAS No. 33 disclosures would be or are potentially useful, the views expressed by company executives in their comment letters in response to the

exposure draft of SFAS No. 33 were pessimistic. Some of the managers opposed the draft very strongly, mostly on grounds of lack of comparability and reliability.

Now, the question is, were their views objective and independent of impact of the disclosures on their companies' financial position, or was the degree of their opposition (or support) dependent upon the shrinkage of the CC/CD income (in relation to HC income) which they were expected to report? If the latter holds, then their comments would have to be regarded as lobbying from a self-interest viewpoint.

Therefore, the purpose of this supplementary analysis is to test if there was any relationship between the tenor of the comment letters (degree of opposition) and the expected adverse impact on income (degree of shrinkage of CC/CD income).

The next chapter deals with the research methodology used in this study.

CHAPTER IV RESEARCH METHODOLOGY

4.1 Data Collection

The sample selection process started with SFAS No. 33 Supplementary Information from the annual reports of firms, which is available in computer readable form through the FASB Statement No. 33 Data Bank Version III marketed by Value Line for about 1350 firms. All the non-financial firms from the data bank giving details of constant dollar as well as current cost adjustment data for the year 1979 were accessed.

For the selected firms from Version III, a comparison with the Industrial Compustat tape was performed in order to identify the firms for which historical cost income and other required financial statement data would be available. There were 934 companies identified as common between these two tapes.

The firms with negative historical cost income were eliminated (as required by the definition of certain variables). Also, the firms in the utility industry were eliminated because the regulatory environment and other peculiarities render these firms different from other

nonfinancial companies for the purpose of financial reporting.

Next, a screening of the Official Summary (of the SEC) information tape released by the National Archives was performed to locate firms with insider trading information availability. This process resulted in a sample of 485 firms.

In order to test the sub-hypothesis related to the ownership effect, the ownership data for the sample firms were collected from Value Line. This procedure resulted in a useable sample of 375 firms for the ownership test.

For the supplementary analysis, copies of the comment letters (related to the exposure draft (ED) of SFAS No. 33) received by the FASB were used. There were 267 comment letters from companies. Of those, 122 were useable for the purpose of the supplementary analysis in this study.

4.2 Dependent Variables

As hypothesized, the dependent variable of this study is the insider trading activity per se (and not the price effects related to such activity). In the present study the variable of interest is net selling, i.e., how much selling were the insiders engaged in, relative to buying. Net insider trading was represented by the following two types of ratios--one for the number of insider transactions and the other for the number of shares traded:

$$ITTR_{it} = \frac{ST_{it}}{PT_{it} + ST_{it}}$$

= Insider Trading Ratio based on number of insider transactions for company i for period t.

where

PT_{it} = number of purchase transactions by the insiders of company i for the period t.

ST_{it} = number of sales transactions by the insiders of company i for the period t.

The transaction basis does not adequately reflect the intensity of sale or purchase, i.e., purchase transactions of one share and one hundred shares are treated equally. Therefore, the ratio based on number of shares traded was constructed as the preferred alternate measure:

$$ITSR_{it} = \frac{SS_{it}}{PS_{it} + SS_{it}}$$

= Insider Trading Ratio on the basis of number of shares of the company i for the period t.

where

PS_{it} = number of shares purchased by the insiders of company i for the period t.

SS_{it} = number of shares sold by the insiders of company i for the period t.

(The term ITR will be used in the following discussion to imply either ITTR or ITSR.)

Table 4.1 reports some summary statistics related to the dependent variables (ITSR and ITTR) of this study.

4.3 Independent Variables

4.3.1 Income Shrinkage Ratio (SR)

The primary independent variable--shrinkage in income--was defined as the complement of the ratio of current cost income to historical cost income.

$$\begin{aligned} SR_i &= 1 - \frac{IFCOCD_i}{IFCOHC_i} \\ &= \text{Shrinkage Ratio for company } i. \end{aligned}$$

where

$IFCOCD_i$ = Income From Continuing Operations on a Constant Dollar basis for company i .

$IFCOHC_i$ = Income From Continuing Operations on a Historical Cost basis for company i .

This definition is such that the higher value of SR implies greater shrinkage. While current cost income is the theoretical principal of interest, the operational definition used constant dollar income in the numerator of the SR measure because of certain design dictated constraints. The primary test period relates to the year 1979 when the SFAS No. 33 supplementary information first became available. The FASB mandated constant dollar information starting with the 1979 fiscal year, while current cost related disclosures were required only from the 1980 fiscal year. Therefore, constant dollar information was available on almost all the companies for the 1979 fiscal year, although some firms voluntarily

disclosed current cost information also for 1979. Hence, on the basis of availability and reliability of 1979 data, constant dollar data were used in calculating shrinkage (SR). The correlation between SRs based on current cost and constant dollar incomes for the entire sample is an extremely high 0.7, significant at 0.001 level. In any event, the analysis was repeated on the basis of CC data (for the subset of firms that reported CC data for 1979), and the results relating to the primary hypothesis were very similar (and hence are not reported). These findings support the use of constant dollar information (in place of current cost data) to augment sample size for portfolio formation on the basis of SR in 1979.

The companies in the sample were ranked on the basis of the shrinkage ratios. On that basis, two portfolios were formed, one (top 40%) with high shrinkage ratios and the other (the bottom 40%) with low shrinkage ratios. (Note that high shrinkage is implied by a larger numerical value of SR and vice versa.) The middle 20% of firms were omitted to reduce noise in the analysis.

The above gross dichotomy was used because it is not clear that the dependent variable (intensity of net insider trading) is necessarily linearly related to the degree of shrinkage in income. Analysis was also performed with more than two classes for the independent variable SR.

4.3.2 Earnings Change (EC)

Insider trading can conceivably be affected by any and all information about the firm that is available privately to insiders. One summary measure used to capture this in past studies has been the insider's presumed private knowledge of historical earnings expectations. This can be measured in several ways (e.g., management forecast of earnings per share [EPS] less current market expectations or simply the difference between the actual EPS of current and prior years). Since this variable has been shown to be predictive of insider trading (Penman, 1982; Allen, 1982; Abdel-Khalik et al., 1984), it is used in this study as an additional independent variable to control for causes of insider trading other than the variable of primary interest (the income shrinkage ratio).

A surrogate for the private knowledge of change in historical cost (HC) earnings expectations by insiders was measured as

$$EC = \frac{HC \text{ Earnings}_t - HC \text{ Earnings}_{t-1}}{HC \text{ Earnings}_{t-1} (> 0)}$$

This earnings change (EC) measure was used to further dichotomize the portfolios into two additional groups (see later discussion).

4.3.3 Control for Industry Membership

Omitting industry specific characteristics means that a firm is being implicitly compared with all the other firms in the economy in order to study the impact of a particular independent variable. If the particular independent variable is correlated with industry membership, then the relationship being studied will be muddled unless the research design blocks on the industry variable. Since the primary independent variable SR is very likely to be affected by industry affiliation, the following procedure was adopted to control for the industry effect.

First, the industry average of SR (shrinkage ratio) was calculated as follows:

$$\text{INDAVSR}_j = \frac{\text{ESR}_i}{n_j}$$

= Average of Shrinkage Ratio for industry j.

where

SR_i = Shrinkage Ratio of firm i (i = 1 to n_j).

n_j = Number of firms in industry j where firm i is a member.

Then the relevant industry average was subtracted from the shrinkage ratio of each firm in the industry. The resulting net or adjusted shrinkage ratio (positive or negative) captures the position of the firm in the industry as well as in the economy.

$$ADJSR_i = SR_i - INDAVSR_j$$

= Shrinkage Ratio of firm i adjusted for its membership in industry j.

4.3.4 Firm Size

Sub-hypothesis H2 deals with the effect of firm size. Two variables were employed; one was "total assets" and the other was "sales."

The partitioning of firms into large and small size portfolios was done on the basis of rank ordering (firm small to large) based on total assets (and sales). Again, the middle 20% of firms was omitted to reduce noise. The top 40% of firms formed the small size portfolio while the bottom 40% of firms were classified as the large size portfolio.

4.3.5 Control Type (Ownership)

Sub-hypothesis H3 in this study is based on the control characteristic of the firms. In order to distinguish owner controlled firms from manager controlled ones, the surrogate used was the percentage of shares held by the insiders. When the percentage of shares held by the insiders was negligible, then the firm was classified by default as a manager controlled firm. In order to establish the cut-off, firms with 5% or less shares held by the insiders were arbitrarily classified as manager controlled. On the other hand, firms with more than 20%

insider holdings were treated as owner controlled. Other firms were omitted from the testing procedure to reduce classification error.

4.4 Research Design

The dates that are of interest in this study are the issuance of the Exposure Draft, publication of the first supplementary information in accordance with the FASB Statement no. 33, and the first ASR 190 information disclosure. Accordingly, the test periods constitute periods just prior to the above events. It is assumed that price-level adjusted income information was internally generated by the firms (during the "test" periods) in anticipation of the forthcoming mandatory requirements, and that the details of this finer information were private to the insiders.

T1. Exposure Draft for SFAS No. 33 (ED 33):

July 1978 - December 1978.

T2. First SFAS No. 33 Information Release: ;

July 1979 - December 1979.

T3. First ASR 190 Information Release:

July 1976 - December 1976.

The following set of control periods was used for comparison with the above test periods.

C1. Three years before the exposure draft (July 1975-Dec. 1975). This time period was chosen because

it is also prior to ASR 190 and the implementation of the exposure draft of 1974 was stopped for the year 1975.

- C2. Three years after the exposure draft and two years after the first information release under SFAS No. 33 (July 1981-Dec. 1981). At this point, the degree of income shrinkage for individual firms is known by market participants, and the novelty of this information has been assimilated in expectations.

Figure 4.1 shows the test and the control periods.

The two independent variables, SR (Shrinkage Ratio) and EC (Earnings Change Ratio), lead to the following basic research design depicted in Figure 4.2.

		Shrinkage (SR)	
		Low	High
Earnings Change (EC)	High (Positive)	Cell 1	Cell 3
	Low (Negative)	Cell 2	Cell 4

Figure 4.2. Basic Research Design

C1		T3		T1		T2		C2	
-----		-----		-----		-----		-----	
Jy 75	De 75	Jy 76	De 76	Jy 77	De 77	Jy 78	De 78	Jy 79	De 79
(CONTROL)		ASR 190 (TEST)		ED 33 (TEST)		SFAS 33 INFO (TEST)		(CONTROL)	
								Jy 80	De 80
								Jy 81	De 81

Test Periods
Control Periods

Figure 4.1. Time Line for Test and Control Periods

The expectation for each of the cells is as follows:

Cell 1: For this cell, the expected shrinkage in income is low, hence there is no incentive for insider selling. Also, other private information represented by historical earnings change (EC) is positive (which by itself would lead to buying rather than selling behavior). Hence, the net impact for this cell is expected to be the lowest value for the dependent variable ITR (which captures net selling).

Cells 2 & 3 Using similar arguments, the ITR values for cells 2 and 3 are expected to be moderate due to the opposing influences of the two variables (in-between that for cells 1 and 4). No significant purchase or sale is anticipated.

Cell 4: The ITR value is expected to be the highest as both variables lead to an expectation of net sales.

The marginal effect of each independent variable separately can be examined by collapsing appropriate pairs of cells. Cells 1 and 2 together represent a portfolio with low shrinkage ratios. Similarly, cells 3 and 4 put together represent a high shrinkage ratio portfolio.

4.5 Operational Hypotheses

4.5.1 Hypothesis 1

To test for hypothesis H1 (disregarding the effect of the EC variable), the following comparison of net selling behavior for the above two collapsed portfolios between the following test and control periods was made (refer to Figure 1 for dates):

- | | |
|-----------|---|
| T1 and C1 | (Period of release of ED 33 with 3 years before the release) |
| T1 and C2 | (Period of release of ED 33 with 3 years after the release) |
| T2 and C1 | (SFAS No. 33 first information period with 4 years before its implementation) |
| T2 and C2 | (SFAS No. 33 first information period with 2 years after its implementation) |
| T3 and C1 | (ASR 190 first information period with one year before its implementation) |

The expectation for the above test(s) of hypothesis H1 can be written as follows:

$$\begin{array}{ccc} [\text{ITR}(\text{T}) - \text{ITR}(\text{C})] & > & [\text{ITR}(\text{T}) - \text{ITR}(\text{C})] \\ \text{Cells 3 \& 4} & & \text{Cells 1 \& 2} \end{array}$$

where (C) is the control period and (T) is the test period.

When the second independent variable Earnings Change (EC) is simultaneously considered, the expectation is

$$\begin{array}{ccc} [\text{ITR}(\text{T}) - \text{ITR}(\text{C})] & > & [\text{ITR}(\text{T}) - \text{ITR}(\text{C})] \\ \text{Cell 3} & & \text{Cell 1} \end{array}$$

and

$$\begin{array}{ccc} [\text{ITR}(\text{T}) - \text{ITR}(\text{C})] & > & [\text{ITR}(\text{T}) - \text{ITR}(\text{C})] \\ \text{Cell 4} & & \text{Cell 2} \end{array}$$

The difference in the insider trading ratios between the test and control periods is designated ITRD in the analysis that follows, i.e.,

$$\text{ITRD} = \text{ITR}(\text{T}) - \text{ITR}(\text{C})$$

In addition to univariate t-tests, the following ANOVA (2 x 2) model was used in the statistical analysis:

$$y = \mu + \alpha + \beta + (\alpha\beta) + \epsilon$$

where

$$y = \text{ITR (test period)} - \text{ITR (control period)}.$$

$$\mu = \text{Mean of ITRD.}$$

$$\alpha = \text{Effect of Shrinkage of CD/CC Income in relation to Historical Income.}$$

$$\beta = \text{Effect of Change in Current Year's Earnings over Previous Year.}$$

$$\alpha\beta = \text{Effect of Interaction.}$$

$$\epsilon = \text{Error Term.}$$

Since the distribution of ITRD may not comply with the assumptions underlying the parametric ANOVA model and given the possibility that such a procedure may not be robust, the ANOVA was repeated using Friedman's nonparametric

procedure based on ranks. Here, all observations (including the middle 20%) are used in the analysis. The (3 x 2) model with three levels of shrinkage (high, middle and low) and two levels of earnings change (high and low) is as follows:

$$y = \mu + \alpha + \beta + (\alpha\beta) + \epsilon$$

where

y = Ranks based on difference in the insider trading ratio between the test and control periods.

μ = Mean of ITR_r.

α = Effect of income shrinkage.

β = Effect of earnings change.

$\alpha\beta$ = Interaction Effect.

ϵ = Error Term.

4.5.2 Size Effect

Given the need to have adequate sample sizes for each of the cells in testing the sub-hypotheses, and given that the results for the primary hypothesis H1 later reveal that the earnings change (EC) control variable was not effective in explaining the variation in ITR, the analyses of the sub-hypotheses do not consider the EC variable. As a result, the research design for sub-hypothesis H2 concerning size is as follows:

		Shrinkage (ADJSR)	
		Low	High
Size	Small	1	3
	Large	2	4

Figure 4.3. Research Design for Size

The hypothesis H2 asserts that for a given level of shrinkage (say, high) net insider selling should be higher for a small size firm than for a large size firm. Following that logic the theoretical expectation is

$$[\text{ITR(T)} - \text{ITR(C)}]_{\text{Cell 3}} > [\text{ITR(T)} - \text{ITR(C)}]_{\text{Cell 4}}$$

Both cells 1 and 2 have low shrinkage in income, that is, not much of a difference is expected between CD and HC incomes. Therefore, the SFAS No. 33 supplementary disclosure may not be a significant factor leading to insider trading. This leads to the expectation of more or less no difference between these two cells.

$$[\text{ITR(T)} - \text{ITR(C)}]_{\text{Cell 1}} = [\text{ITR(T)} - \text{ITR(C)}]_{\text{Cell 2}}$$

In addition to univariate t-tests, the following 2 x 2 ANOVA model and a general linear model were tested combining both size and control effects for each of the two portfolios based on shrinkage of income.¹

$$y = \mu + \alpha + \beta + \epsilon$$

where

$$y = \text{ITR(T)} - \text{ITR(C)}$$

$$\mu = \text{Mean of ITRD}$$

$$\alpha = \text{Effect of Size}$$

$$\beta = \text{Effect of Control}$$

$$\epsilon = \text{Error Term}$$

4.5.3 Control (Ownership) Effect

The purpose of introducing this variable is to analyze whether the separation of control from ownership leads to abnormal insider trading behavior on the part of managers who do not have a large percentage of ownership interest in the company. Therefore, division of portfolios on the basis of percentage of ownership held by managers becomes part of the experimental design. Two portfolios, one for manager controlled firms and the other for owner controlled firms, were formed. This kind of division coupled with the partition on the basis of shrinkage leads to the following research design.

Shrinkage (ADJSR)		
	Low	High
Control	Manager 1	3
	Owner 2	4

Figure 4.4. Research Design for Control

For the high shrinkage portfolio, the expectation is that the ITR for manager controlled firms should be higher than the ITR for owner controlled firms. This can be written as follows with reference to figure 4.

$$[\text{ITR(T)} - \text{ITR(C)}]_{\text{Cell 3}} > [\text{ITR(T)} - \text{ITR(C)}]_{\text{Cell 4}}$$

Such a direction is indeterminate for the low shrinkage portfolio.

In order to make the above comparisons, a series of difference between means tests was conducted. Also, the ANOVA and regression models referred to in section 4.5.2 were used to analyze the effect of the control variable.²

4.5.5 Supplementary Analysis

The comment letters (received by the FASB) from the insider managers was the basis of the analysis. Each one of the letters was classified into one of the two following categories:

- (1) Strong degree of opposition,
- (2) Neutral to weak opposition.

The comment letters are open-ended, i.e., not answering questions with "yes" or "no" options. To categorize them as those opposed strongly (versus others) is a judgmental exercise. This two-way classification along with the four cells in the basic research design (figure 4.2) leads in building up the following matrix.

	Manager (Comment Opposition Letters)	
	(S)	(N)
	Strong	Not Strong
	Number of firms	Number of firms
Cells (Shrinkage and EC)	1	<
	2	
	3	
	4	>

Figure 4.6. Design for Supplementary Analysis

If there is a relationship between the tenor of comment letters and firm characteristics (shrinkage and EC), then the expectation of number of firms in each of the sub-cells is as follows (these hypotheses are exploratory):

1. As for cell 1, because of low shrinkage and positive EC, insiders have less incentive to strongly oppose the exposure draft. Therefore, the number (proportion) of firms in sub-cell 1S is expected to be less than or equal to the number (proportion) in sub-cell 1N.
2. For cell 4, the shrinkage is high and EC is low (negative). Hence, there may be strong opposition to the exposure draft from the insiders. This leads to the expectation that the number of firms in sub-cell 4S will be greater than in sub-cell 4N.
3. For cells 2 and 3, because of opposing characteristics, no significant difference is expected between cells 2S and 2N (and 3S and 3N).
4. Also, to test if the trading behavior (ITR) and the intensity of opposition to the exposure draft are independent of each other a χ^2 test was conducted.

The next chapter presents the results of the empirical analysis.

TABLE 4.1
SUMMARY OF DEPENDENT VARIABLES

Period (Test or Control)	Type of ITR	N	Mean	Std.Dev.	Min	Q1	Med	Q3	Max
T1 Exposure Draft of SFAS No. 33 July-Dec. 78	ITSR	339	0.614	0.413	0.00	0.125	0.818	1.00	1.00
	ITTR	339	0.573	0.389	0.00	0.182	0.667	1.00	1.00
T2 First SFAS No. 33 Information July-Dec. 79	ITSR	344	0.705	0.389	0.00	0.431	0.955	1.00	1.00
	ITTR	344	0.685	0.362	0.00	0.400	0.795	1.00	1.00
T3 ASR 190 Information July-Dec. 76	ITSR	344	0.695	0.394	0.00	0.367	0.943	1.00	1.00
	ITTR	344	0.661	0.367	0.00	0.400	0.800	1.00	1.00
C1 July-Dec. 75	ITSR	347	0.601	0.410	0.00	0.081	0.738	1.00	1.00
	ITTR	347	0.552	0.383	0.00	0.188	0.571	1.00	1.00
C2 July-Dec. 81	ITSR	345	0.601	0.429	0.00	0.009	0.839	1.00	1.00
	ITTR	345	0.566	0.392	0.00	0.141	0.667	1.00	1.00

TABLE 4.2
SUMMARY OF INDEPENDENT VARIABLES

	N	Mean	Std.Dev.	Min	Q1	Med	Q3	Max
EC 76	446	0.447	1.373	-1.987	0.080	0.245	0.489	21.00
EC 78	450	0.301	1.344	-8.107	0.088	0.194	0.370	24.75
EC 79	456	0.446	2.403	-0.950	0.085	0.208	0.383	48.25
SR	465	0.950	7.128	-53.400	0.261	0.435	0.733	138.82
ADJSR	413	0.463	7.669	-54.070	-0.236	-0.068	0.170	140.82
Ownership	375	16.89%	18.25%	0.20%	2.00%	9.00%	28.00%	81.00%
Total Asset	413	1773.1 m	5949.5 m	45.3 m	267.0 m	522.0 m	1647.3 m	103327.0 m
Sales	413	2137.1 m	4917.6 m	47.7 m	356.0 m	767.9 m	2202.0 m	60334.0 m

Notes

1. There is also the expectation of difference in insider trading activity within the portfolio of small firms arising because of the effect of shrinkage in current cost income (the effect studied in hypothesis H1). This expectation can be rechecked as

$$\begin{array}{ccc} [\text{ITR(T)} - \text{ITR(C)}] & > & [\text{ITR(T)} - \text{ITR(C)}] \\ \text{Cell 3} & & \text{Cell 1} \end{array}$$

Within the set of large firms, however, generally a lower overall level of insider trading activity is expected. Therefore, strict inequality may not hold, i.e.,

$$\begin{array}{ccc} [\text{ITR(T)} - \text{ITR(C)}] & \geq & [\text{ITR(T)} - \text{ITR(C)}] \\ \text{Cell 4} & & \text{Cell 2} \end{array}$$

2. The expectation for manager controlled firms is as follows:

$$\begin{array}{ccc} [\text{ITR(T)} - \text{ITR(C)}] & > & [\text{ITR(T)} - \text{ITR(C)}] \\ \text{Cell 3} & & \text{Cell 1} \end{array}$$

In the case of owner controlled firms, not much of insider trading activity is expected regardless of shrinkage. Therefore for owner controlled firms, the expectation can be written as follows:

$$\begin{array}{ccc} [\text{ITR(T)} - \text{ITR(C)}] & \geq & [\text{ITR(T)} - \text{ITR(C)}] \\ \text{Cell 4} & & \text{Cell 2} \end{array}$$

CHAPTER V RESULTS OF STATISTICAL ANALYSIS

Results of the empirical analysis of the hypotheses developed in Chapter III are presented in this chapter. The order of presentation follows the order of the hypotheses. The first four sets of tests (Tables 5.1-5.4) relate to the primary hypothesis H1 without industry variable. The next five sets (Tables 5.5-5.9) provide the results for hypothesis H1 after controlling for the industry variable. Then, the results for sub-hypothesis H2 (firm size effect) are presented. These results (Tables 5.10-5.13) are based on total assets as the measure of size. Results based on alternate measure of size (sales) are very similar and hence not reported. Hypothesis 3 (ownership effect) results are presented in Tables 5.12-5.15, followed by some preliminary supplemental analysis (Table 5.16) dealing with managers' views expressed in comment letters to the FASB.

Each hypothesis is evaluated for each of the three test periods (T1, T2 and T3) considered: those related to the exposure draft for SFAS No. 33, first release of information under SFAS No. 33 and ASR 190. Two control

periods are used in the design for comparison purposes, one before (C1) and one after (C2) the test periods. ASR 190 test period was compared with only C1 and not C2 because a control period of five years after the test period may not really serve the purpose.

5.1 Results for Primary Hypothesis H1

Hypothesis H1 posits that given a shrinkage in the CC/CD income, insiders of high shrinkage firms would have engaged in more net selling than those of low shrinkage firms just prior to the first public release of price adjusted information.

The statistical tests used to analyze H1 data include univariate t-tests, a (2 x 2) ANOVA and a (3 x 2) nonparametric ANOVA models. Though ANOVA model by itself can enable one to make inferences from the tests, in order to interpret its results, one needs to look at the means of the dependent variable (if they increase or decrease following the effect for different levels). In that sense, the univariate t-tests in this study can help in interpreting the ANOVA results. Also, the univariate t-tests give results for subdivisions of portfolios (as high and low shrinkage) which is not available in the general 2 x 2 ANOVA model tested in this study. Therefore, both the univariate t-tests and ANOVA models were used. Two

sets of tests, one without a control for industry variable and the other with such a control, are presented for H1.

Basically the statistical procedure of this study aims at analyzing the differences in the selling behavior (referred to as ITSR or ITTR) between the two sets of firms (high and low shrinkage) during the test and control periods. Therefore, division of firms into two portfolios, high and low shrinkage (SR), was the first step. The firms were rank ordered on the basis of SR (Shrinkage Ratio) from large to small.

The SR used for all three tests was based on 1979 CD and HC income. There was no disclosure of CD income during 1976 and 1978, as SFAS No. 33 was not mandated before 1979. Also, not much difference in the shrinkage ratio (SR) is expected in a period of a year or three within a firm, and hence the composition of low and high shrinkage portfolios is not expected to be different using the SR based on 1979 data only. The middle 20% of the firms rank ordered based on SR was omitted in order to reduce the classification error, the top 40% and the bottom 40% forming the high and low shrinkage portfolios respectively.

To evaluate the net selling activity of the insiders, a difference between the average net selling ratios of the two periods (test minus control) hereafter referred to as ITRD was calculated for each of the two portfolios dichotomized on the basis of SR (i.e., high versus low

shrinkage) and a difference between means test was conducted. Also, a (2 x 2) ANOVA and a (3 x 2) nonparametric ANOVA models were tested, all sets of tests confirming the assertions of the primary hypothesis H1. Two bases of selling strategy, i.e., number of transactions and number of shares traded, were used in the analysis without controlling for the industry variable. For subsequent analysis, the transaction basis was omitted, because as already stated it does not reflect the intensity of trading.

5.1.1 Results for Primary Hypothesis H1 without Industry Variable

5.1.1.1 T-test results for H1--High earnings change portfolio

The variable, earnings change (EC) was used to bisect the sample into two groups: a high earnings change and a low earnings change portfolio. Table 5.1 gives the results for the high earnings change portfolio. The average net selling ratio (of test period minus control period), ITRD is compared for the low shrinkage versus the high shrinkage portfolios. When the ITRD for the low shrinkage portfolio is subtracted from that of the high shrinkage portfolio, the difference is hypothesized to be positive. The difference for all the five comparisons based on number of shares basis (two for SFAS No. 33 exposure draft, two for first SFAS No. 33 information, and one for ASR 190

information) is positive as expected. The difference based on number of transactions is positive for four out of five comparisons (the exception being the SFAS No. 33 first information test period comparison with a control period before the event hereafter referred to as C1 (before)). In all the four tests for the exposure draft for SFAS No. 33 the statistical significance is around a 6% level. The results for the first SFAS No. 33 information and ASR 190, however, are not statistically significant.

5.1.1.2 T-test results for H1--Low earnings change portfolio

Table 5.2 presents the results of the tests for low earnings change portfolio. The difference of ITRDs (high minus low shrinkage portfolios) is positive for all the ten comparisons (five for number of shares basis plus five for transaction basis) as hypothesized. The significance levels for the SFAS No. 33 exposure draft and first SFAS No. 33 information both compared with the control period C2 (after) are significant at conventional levels while for the other six comparisons (including the two for ASR 190) are not significant at reasonable levels, though the resulting sign is in the expected direction.

5.1.1.3 T-test results for H1--Comparison of high and low shrinkage portfolios without considering earnings change

In order to ascertain what the results would have been if the variable EC had not been introduced, the results in this section refer to the direct tests without EC. Table 5.3 presents the results of the comparisons disregarding the earnings change variable. The results based on number of shares as well as number of transactions are mostly in the expected direction. The difference arising from subtracting the net selling ratio (ITRD) of low shrinkage from that of high shrinkage portfolio is positive for all five tests based on number of shares (ITSR) and statistically significant at 5% levels of significance (except SFAS No. 33 C1 (before) at 12% and ASR 190 at 17%). The results for transaction based tests (ITTR) indicate that the signs are in the expected direction for all tests except for the comparison of first SFAS No. 33 test with C1 (before). The results of ITTR for the exposure draft for SFAS No. 33 are significant at conventional levels. The first SFAS No. 33 test comparison with C2 (after) is significant at 12.5%. ASR 190 test is not significant at a reasonable level.

5.1.1.4 ANOVA results for H1--Number of shares basis

A (2 x 2) ANOVA model was thought fit for the experimental design used in this study. The primary

independent variable, SR (shrinkage ratio) was used to form two portfolios (high and low shrinkage) each with 40% of sample. This is represented as two levels in the first effect (shrinkage). Next, the control variable EC, again, bisects the sample into two groups (high and low EC). This is also represented as two levels in the second effect ('surprise' in earnings change). The (2 x 2) analysis of variance (ANOVA) model for testing the primary hypothesis (H1) is as follows:

$$y = \mu + \alpha + \beta + (\alpha\beta) + \epsilon$$

where

$$y = \left[\frac{\text{Sales}}{\text{Sales} + \text{Purchases}} \right]_{\text{Test Period}} - \left[\frac{\text{Sales}}{\text{Sales} + \text{Purchases}} \right]_{\text{Control Period}}$$

μ = Mean of y (Insider Trading Ratio Difference).

α = Effect of Shrinkage Income.

β = Effect of Earnings Change.

$\alpha\beta$ = Effect of Interaction.

ϵ = Error Term.

Both independent variables, shrinkage and earnings change, have two levels each (high and low).

For this ANOVA model and all the other tests, number of shares basis (ITSR) only was used because it is considered a more valid measure than the transaction basis (ITTR).

The results are reported in Table 5.4. The Shrinkage Effect is statistically significant for both the tests based on the exposure draft for SFAS No. 33 using both the control periods, while for the first SFAS No. 33 information it is significant only for C2 (after). However, for the C1 (before) comparison the attained significance is not satisfactory. ASR 190 test result also does not show a significant shrinkage effect. None of the five tests shows that the earnings change variable has statistical significance. Also there is no significant interaction effect.

5.1.1.5 Summary analysis of results of primary hypothesis H1 without control for industry variable

The tests for the primary hypothesis H1 were run on two bases: (1) without control for industry variable and (2) controlling for industry effect. The four tables 5.1 through 5.4 deal with the results of H1 without controlling the industry effect. Both the number of transactions and the number of shares bases were considered.

Exposure draft for SFAS No. 33. In all the tests (including ANOVA) for exposure draft for SFAS No. 33 comparison with C2 (after), the results are significant at 4% level. Similarly in the tests comparison with C1 (before), all results reveal statistical significance at or less than 7% level, the only exception being the low earnings change portfolio where the attained significance

is 20%. Overall the tests relating to the exposure draft for SFAS No. 33 reveal compatibility with the primary hypothesis H1.

First release of SFAS No. 33 information. The tests (including ANOVA) with the control period C2 (after) both on number of transactions and shares bases show significant results at 10% level, the only exception being the high earnings change portfolio. In all the tests (including ANOVA) with the control period C1 (before) results are not significant except when EC is ignored and that too for number of shares basis only. There is partial support for first SFAS No. 33 information based H1 tests without industry variable.

ASR 190. The ASR 190 tests do not show significant results except where the earnings change variable is ignored when the attained significance is 17%. Only a very weak support can be drawn for ASR 190 tests.

Earnings change variable. In all these tests, the earnings change variable does not seem to have the expected impact. Recollect that this variable was used because of its inclusion in some prior studies on insider trading. However, even in those studies the impact of this variable was not always consistent. Also, in some of these studies, the measurement of unexpected earnings was based on forecasts made by management, while the measure used in this study was based simply on prior years' actual

earnings. The sign (direction) observed for this variable is in the expected direction, but significance levels are not reached. It may be remembered that the main focus of this study relates to the impact of "shrinkage" in income while the "earnings change" variable is only a control device.

5.1.2 Industry Adjustment of Shrinkage Ratio

Formation of portfolios on the basis of the raw shrinkage ratio effectively compares a firm with all the other firms in the economy. However, different industries have different characteristics and comparison may be more meaningful (especially, for income shrinkage) if done relative to other firms in the same industry. It is relatively easy for outsiders to gauge the impact of inflation on the industry as a whole, but the relative position of the firm within the industry cannot be precisely known without more detailed information (which is what insiders possess in the predisclosure period). Hence, the divergence of the shrinkage ratio of the firm from the industry average would be the appropriate measure of the primary independent variable. As described earlier in Chapter IV the following steps were used to adjust the shrinkage ratio of the firm relative to the industry average.

$$INDAV_j = \frac{\sum SR_i}{n_j}$$

= Average of SR for industry j.

where

SR_i = Shrinkage ratio of firm i.

n_j = number of firms in industry j in which firm i is a member.

$$ADJSR_i = SR_i - INDAV_j$$

= Shrinkage ratio of firm i adjusted for industry membership.

ADJSR measures a firm's shrinkage ratio relative to the industry average.

In the following five sets of tests (Tables 5.5 through 5.9) ADJSR replaces the raw SR, thereby controlling for the industry effect.

5.1.2.1 Results for H1--High earnings change portfolio with control for industry effect--Table 5.5

All the five differences (i.e., ITRD for high shrinkage minus ITRD for low shrinkage portfolios) are positive in the expected direction. Also all the five tests are statistically significant within or around 10% level of significance. The results for ASR 190 are also in support of the primary hypothesis H1 with the significance level at 6.8%.

5.1.2.2 Results for H1--Low earnings change portfolio with control for industry effect--Table 5.6

All the differences (ITRD for high shrinkage minus ITRD for low shrinkage portfolios) are positive as hypothesized. The result for the exposure draft with the control period C2 is significant at 6% while the test result with C1 is not significant at a reasonable level. The first SFAS No. 33 information results are significant at around 10% level. The results for ASR 190 are significant at 11.6%.

5.1.2.3 Results for H1--Comparison of high and low shrinkage portfolios without considering earnings change variable--Table 5.7

The difference between the selling ratios for the two portfolios (i.e., ITRD for high shrinkage firms minus ITRD for low shrinkage firms) is positive as hypothesized for all five tests (i.e., two for the exposure draft for SFAS No. 33, two for the first SFAS No. 33 information, and one for ASR 190 information). Apart from the correct direction, all five results are statistically significant around the 5% level. The results are fully in support of the primary hypothesis. ASR 190 also seems to have led to insider trading activity, the statistical significance for which is 3%.

5.1.2.4 ANOVA results for H1--Industry control and earnings change variable included

The 2 x 2 ANOVA results based on ADJSR (low and high) and EC (low and high) are presented in Table 5.8. While R^2 is not high, ADJSR (shrinkage ratio for individual firms adjusted for industry average) is significant at or below the 8% level for all five tests. The earnings change variable does not seem to have statistical significance, corroborating earlier evidence based on univariate t-tests. Also, there is no significant interaction. Thus, all five sets of tests controlling for the industry effect provide a high degree of support for the primary hypothesis H1.

5.1.2.5 Nonparametric ANOVA results for H1--Industry control and earnings change variable included

Since insider trading (ITSR and ITTR) distributions may not be well behaved and given the possibility that parametric procedures may not be appropriate, the ANOVA is repeated using Friedman's nonparametric procedure based on ranks. Here, all observations are used, i.e., the middle 20% observations on the shrinkage variable (that were excluded previously in the parametric tests) are now included. The model used is

$$\text{ITRD}_{\text{rank}} = f(\text{ADJSR}, \text{EC}, \text{Interaction})$$

where

ADJSR = 3 levels (high, middle and low).

EC = 2 levels (high and low).

Panel A of Table 5.9 shows the means of the ranks of ITRD for different levels of the independent variables. The mean of the ITRD is expected to be positively related to the level of shrinkage, that is, the higher the shrinkage the higher is the expectation for net insider selling. For all five sets the observed pattern of mean is in compliance with the theoretical expectations for the shrinkage variable.

The attained significance levels for the F tests for the first release of SFAS No. 33 information for the two control periods C1 (before) and C2 (after) are 4.9% and 9.2% respectively. The respective significance levels for the exposure draft tests are 23.9% and 3.5%. For ASR 190, the attained significance is 6.7%. These results, again support the primary hypothesis H1.

5.1.2.6 Summary of results for H1--Controlling for industry membership

These tests were conducted using number of shares basis since this measure captures the intensity of trading

(while number of insider transactions does not). Tables 5.5 through 5.9 provide the details of the tests.

Exposure draft for SFAS No. 33. For all three univariate tests relative to the C2 (after) control period, the difference between the ITRD of the low shrinkage portfolio and that of the high shrinkage portfolio is positive as posited. Also, all the tests (including both parametric and nonparametric ANOVA) reveal statistical significance at or less than 6% level. In similar tests using control period C1 (before), the difference for all the t-tests shows the expected direction. Four tests reveal significant results at or less than 8%. The only test here that does not show a reasonable level of significance relates to the low earnings change portfolio.

First SFAS No. 33 information. For the set of t-tests where the earnings change variable is ignored, the tests relative to both control periods (C1 and C2), provide significant results, that is, less than 4%. For the low earnings change portfolio the attained significance relative to the C1 and C2 periods is 8.5% and 13.5%, respectively. For similar tests based on high earnings change portfolio the significance levels are 13.5% and 4.7%. Finally the ANOVA results, relative to both control periods, are significant at 7% and 4%. The nonparametric ANOVA tests show significant levels of 4.9% and 9.2% respectively. The tests narrated in this section lend good

support to the primary hypothesis that the earnings shrinkage disclosed through SFAS No. 33 is associated with net selling on the part of insiders.

ASR 190 information. For the t-tests where the earnings change variable is ignored, the attained significance is 3%. The results based on blocking into the high and low earnings change portfolios reveal significance at 6.8% and 11.6% levels. The ANOVA results for the parametric and nonparametric procedures show significance at 3.7% and 6.7% levels for the shrinkage variable. All the tests for ASR 190 information support the primary hypothesis H1.

In these analyses, the earnings change variable again does not seem to have significant impact on insider trading activity.

The following sections 5.2 through 5.3 relate to tests of sub-hypotheses H2 and H3 which use finer partitioning variables. Since the EC variable was not significant in the various tests relating to H1, the sub-hypotheses were tested without the EC variable. The shrinkage variable used in the sub-hypotheses analysis is that adjusted for industry membership, that is, ADJSR and not SR. Two univariate t-test procedures were used for each of the sub-hypotheses (one for the high shrinkage and one for the low shrinkage portfolios).

Finally H2 and H3 were tested simultaneously in a multivariate analysis. First the firms were split into high and low shrinkage subsets (to neutralize the H1 effect). Then, within each shrinkage subset, a 2 x 2 ANOVA and regression were run with firm size and type of control as independent variables and ITRD as the dependent variable.

5.2 Size Effect (H2)

The size of a firm can be measured variously as the level of sales, total assets, market value, etc. In this study both the sales and total assets bases were used. Since the results are similar, only those pertaining to the total assets measure are reported.

First the sample was split into high and low shrinkage, as before. Then, the firms were rank ordered from small to large on the basis of total assets. The middle 20% of the sample was omitted to reduce classification error. The top 40% of firms was classified as small and the bottom 40% as large. The 2 x 2 design used for testing the size effect follows (Figure 4.3 is repeated below):

Shrinkage (ADJSR)		
	Low	High
Size	Small	3
	Large	4

Figure 4.3. Research Design for Size

Referring to Figure 4.3, the principal comparison of interest in this section is between cell 3 (small size firms) and cell 4 (large size firms), both in the high shrinkage portfolio. Within the low shrinkage portfolio, not much insider trading activity is expected. Therefore a further partitioning of the low shrinkage portfolio into small and large size firms is not expected to yield directional results. Thus, while both high and low shrinkage portfolios were analyzed, the primary test for size effect is within the high shrinkage portfolio only.

5.2.1 Size Effect--High Shrinkage Firms--Table 5.10

Within high shrinkage firms, one would expect more insider selling for the smaller firms during the test periods. For all the five tests (including ASR 190), the difference in net selling activity (ITRD for small firms minus ITRD for large firms) is positive as hypothesized.

The results for the exposure draft for SFAS No. 33 and the first SFAS No. 33 information comparison, relative to the control period C2 (after), are not statistically significant. The other three results including ASR 190 are satisfactory.

5.2.2 Size Effect--Low Shrinkage Firms--Table 5.11

Within low shrinkage firms, there is not expected to be much unusual trading during the test periods. As such, further partitioning based on the size of firm is also not expected to yield distinguishing results. Hence, there is no a priori expectation for directional results. The results indicate that the difference (i.e., ITRD for small minus ITRD for large size portfolio) for four out of five comparisons is negative, while for the other it is positive.

5.2.3 Size Effect--ANOVA and Regression Results

Table 5.12 presents the results of the joint hypotheses tests for H2 and H3 using ANOVA and regression models within the high shrinkage portfolio. The two independent variables are size (small versus large) and control (manager versus owner), and the dependent variable is the ITRD (that is, difference in the net selling ratios between the test and control periods). In both ANOVA and regression procedures, three out of five results in each

show that the sign of insider trading is in the expected direction. The regression results for SFAS No. 33 first information test comparison with C1 (before) and ASR 190 are statistically significant at 15.5% and 11.9%, respectively. There is no ex ante specification of direction for the low shrinkage portfolio. However, results as reported in Table 5.13 show that the ED and first information tests relative to C2 (after) are significant.

5.2.4 Summary of Results for Size Effect (H2)

Exposure draft for SFAS No. 33. The crucial test of the size effect is for the high shrinkage portfolio. The t-test relative to the C1 control period is in support of the size effect (at 4%), while that for the control period C2 is not so. Within the low shrinkage portfolio not much trading activity is expected, and the t-test results do not show any pattern as expected. However, for the regression procedure (Table 5.13) the size effect appears to show through even for the low shrinkage portfolio. The ANOVA result for the exposure draft of SFAS No. 33 relative to the control period C1 (before) lends weak support to the size effect at 18.5% significance. The sign of beta (for the same test and control period) is negative (as expected) in the linear model.

First SFAS No. 33 information. In the ANOVA results for both tests (C1 and C2), the direction of selling ratio from small to large portfolios is declining as expected. In the general linear model, the direction of beta is negative (as expected) for the control period C1 and statistically significant at 15.5%.

ASR 190 information. There is some support for the size effect within the high shrinkage portfolio, the attained significance being 12.7%. The same is confirmed with the general linear model where the attained significance is 11.9%.

5.3 Ownership Effect (H3)

The primary purpose of introducing this variable is to test whether there is any difference in the level of insider trading due to the separation of ownership from control. Specifically, the question is whether the insider trading activity in the owner controlled firm is less than that in the manager controlled firm. Therefore, in addition to dichotomizing the sample into high and low shrinkage groups, further partitioning was done on the basis of percentage of shares held by insiders. A holding of 5% or less was classified as manager controlled and that of more than 20% as owner controlled. A holding of between 5% and 20% was omitted from the testing procedure in order to reduce classification error. Again, the 2 x 2 design

used for testing this effect follows (Figure 4.4 is repeated below):

		Shrinkage (ADJSR)	
		Low	High
Control	Manager	1	3
	Owner	2	4

Figure 4.4. Research Design for Control

5.3.1 Ownership Effect--High Shrinkage Portfolio--
Table 5.14

Referring to Figure 4.4, the desired comparison in this section is between cell 3 (manager controlled firms) and cell 4 (owner controlled firms), both belonging to the high shrinkage group. Since insider trading is not expected to be significant for the low shrinkage groups, a further partitioning of the group by the type of control is not expected to yield any directional results. Thus there is no expectation for the comparison of cell 1 with cell 2. The test of ownership effect, therefore, relies on the subdivision of the high shrinkage group only, with the expectation that the manager controlled firms (cell 3) would experience greater net selling than the owner controlled firms (cell 4). The results indicate that in

four out of five tests (reported in Table 5.14) the sign of difference (that is, ITRD for manager minus ITRD for owner firms) is positive as expected. The only negative sign is for the test for the exposure draft of SFAS No. 33 relative to the control period C2 (after). Here, only the ASR 190 test indicates statistical significance at the 4% level.

5.3.2 Ownership Effect--Low Shrinkage Portfolio-- Table 5.15

As reported in the previous sections, there is no expectation of direction in the difference between ITRDs (for manager minus owner firms) within the low shrinkage portfolio. There is only marginal difference in the five tests (including ASR 190 test), all with negative signs. None of the tests is significant as expected. There is no unusual trading activity within the low shrinkage portfolio.

5.3.3 ANOVA and Regression Results for H3-- Tables 5.12 and 5.13

The earlier ANOVA and multiple regression models provide simultaneous results for type of control and firm size as independent variables and ITRD as the dependent variable. Table 5.12 reports the results for the high shrinkage portfolio, which is the important subset in this analysis. In 4 out of 5 tests (in the ANOVA analysis), the sign of selling behavior is in the expected direction. In

the general regression analysis, the first SFAS No. 33 information test with control period C1 is significant at a reasonable level. In both the ANOVA and regression tests, ASR 190 results are significant. For the low shrinkage portfolio, no specific direction is revealed (see Table 5.13), which is expected.

5.3.4 Summary of Results for Ownership Effect

Exposure draft for SFAS No. 33. The primary test for the ownership effect was conducted within the high shrinkage portfolio. Of the two ITRD differences, the one relating to C1 (before) is positive in the t-test analysis as expected, and the other (relative to C2) is in the expected direction in the ANOVA tests. Only a very weak support can be drawn from the results.

First SFAS No. 33 information. Both the differences (within the high shrinkage firms) are in the expected direction in all the analyses. The attained significance relative to C1 (before) is at 7% in the regression tests. Some positive results are obtained for the control variable.

ASR 190 information. The results for ASR 190 information are in support of the ownership effect. The attained significance is at conventional levels in all the tests.

5.4 Supplementary Analysis

The focus of this study, as is apparent, is on the behavior of an important class of investors, the company insiders and their trading activity. Contrary to the assumption that SFAS No. 33 is potentially useful, the view of the managers expressed in their comment letters to the FASB in response to the exposure draft for SFAS No. 33 is generally pessimistic.

A glimpse of the comment letters reveals that some of the respondents opposed the draft strongly. One obvious reason is the imposition of additional cost of furnishing supplementary information. Another reason cited is comparability. The managers (19.47%) felt that the inter- as well as intra-company comparability would be affected because of the flexibility in measurement allowed by SFAS No. 33. Considerable percentage of the insider managers (32.7% of the respondents) showed concern that estimates of "current cost" are essentially subjective and therefore lack reliability and hence value.

While others, especially academicians, have assumed potential usefulness (and have tried to test for its effects), firm managers have downplayed the significance of this new information. However, since the expected effects on the market value of the firms were supposed to be adverse, on average, it is conceivable that managements of firms may have (to some degree) purposely downplayed the

usefulness of SFAS No. 33 information in order to mitigate the adverse impact. Hence, the question arises as to whether the managers really meant what they said or were they downplaying the utility of the information to mitigate the possible negative stock market reaction.

In order to test if the managers were motivated primarily by self interest or whether there were indeed objective reasons for their negative comments, the following tentative supplementary analysis is offered. The comment letters were classified into either (1) strong opposition or (2) neutral to weak opposition. This two way classification along with the four cells in Figure 4.2 lead to the following results (reported in Table 5.16).

Within the division in cell 1, the number of firms giving strong opposition is smaller than those not giving a strong degree of opposition. This is in the expected direction. However, in cell 4 there was supposed to be greater opposition. But the opinion between strong opposition and weak opposition is even at 12, not in any direction.

A χ^2 test was conducted to test for the independence between the degree of opposition and the position of the firm (that is, the degree of shrinkage and earnings change). The calculated value of χ^2 is 3.87 which is not significant at the 10% level. The degree of opposition and

the relative position of the firm may be interpreted to be independent.

TABLE 5.1
T-TEST RESULTS FOR H1
HIGH EARNINGS CHANGE PORTFOLIO

Periods	Type of ITR	Mean Values for ITRD		Difference	t-value	Significance One tailed test
		High Shrinkage Portfolio N	Low Shrinkage Portfolio N			
EXPOSURE DRAFT FOR SFAS NO. 33						
T1 - C1	ITSR	38	0.121	0.157	1.609	0.055
	ITTR	38	0.145	0.137	1.523	0.065
T1 - C2	ITSR	37	0.092	0.192	1.999	0.024
	ITTR	37	0.067	0.157	1.758	0.041
FIRST SFAS NO. 33 INFORMATION						
T2 - C1	ITSR	45	0.110	0.087	0.807	0.21
	ITTR	45	0.036	-0.079	-0.809	0.21
T2 - C2	ITSR	44	0.110	0.076	0.739	0.23
	ITTR	44	0.075	0.022	0.224	0.41
ASR 190						
T3 - C1	ITSR	57	0.149	0.053	0.626	0.27
	ITTR	57	0.147	0.005	0.058	0.48

$$\text{ITSR} = \left[\frac{\text{Sales}}{\text{Sales} + \text{Purchases}} \right] \dots \quad \text{ITTR} = \left[\frac{\text{Sales}}{\text{Sales} + \text{Purchases}} \right] \quad \text{Based on number of transactions}$$

$$\text{ITRD} = [\text{ITSR or ITTR}]_{\text{test period}} - [\text{ITSR or ITTR}]_{\text{control period}}$$

C1 and C2: Control periods before and after the test periods, respectively.

TABLE 5.2
T-TEST RESULTS FOR H1
LOW EARNINGS CHANGE PORTFOLIO

Periods	Type of ITR	Mean Values for ITRD			Difference	t-value	Significance One tailed test
		High Shrinkage N	Low Shrinkage N	Portfolio			
EXPOSURE DRAFT FOR SFAS NO. 33							
T1 - C1	ITSR	74	0.051	57	-0.024	0.075	0.864
	ITTR	74	0.046	57	-0.019	0.065	0.835
T1 - C2	ITSR	71	0.113	57	-0.089	0.202	2.212
	ITTR	71	0.101	57	-0.100	0.201	2.402
FIRST SFAS NO. 33 INFORMATION							
T2 - C1	ITSR	69	0.163	58	0.115	0.048	0.558
	ITTR	69	0.176	58	0.142	0.034	0.420
T2 - C2	ITSR	64	0.221	58	0.054	0.167	2.029
	ITTR	64	0.160	58	0.059	0.101	1.263
ASR 190							
T3 - C1	ITSR	64	0.107	62	0.048	0.059	0.803
	ITTR	64	0.098	62	0.075	0.023	0.327

0.21
0.37

TABLE 5.3
T-TEST RESULTS FOR H1
COMPARISON OF HIGH AND LOW SHRINKAGE PORTFOLIOS WITHOUT CONSIDERING EARNINGS CHANGE

Periods	Type of ITR	Mean Values for ITRD			Difference	t-value	Significance One tailed test
		High Shrinkage N	Low Shrinkage N	Portfolio			
EXPOSURE DRAFT FOR SFAS NO. 33							
T1 - C1	ITSR	112	0.074	123	0.104	1.642	0.05
	ITTR	112	0.080	123	0.084	1.413	0.079
T1 - C2	ITSR	108	0.106	122	0.201	3.001	0.0015
	ITTR	108	0.089	122	0.183	2.951	0.0015
FIRST SFAS NO. 33 INFORMATION							
T2 - C1	ITSR	114	0.142	126	0.077	1.545	0.12
	ITTR	114	0.121	126	-0.006	-0.108	0.46
T2 - C2	ITSR	108	0.176	126	0.133	2.065	0.02
	ITTR	108	0.125	126	0.069	1.132	0.125
ASR 190							
T3 - C1	ITSR	121	0.127	128	0.054	0.967	0.17
	ITTR	121	0.121	128	0.011	0.216	0.41

TABLE 5.4
ANOVA RESULTS FOR H1
(BASED ON NUMBER OF SHARES)

Test Period	R ²	Shrinkage		Earnings Change		Interaction	
		F Value	Significance	F Value	Significance	F Value	Significance
EXPOSURE DRAFT FOR SFAS NO. 33							
T1 - C1	0.015	3.31	0.07	0.06	0.79	0.23	0.629
T1 - C2	0.046	10.65	0.001	0.16	0.69	0.07	0.787
FIRST SFAS NO. 33 INFORMATION							
T2 - C1	0.011	1.35	0.246	1.24	0.26	0.09	0.76
T2 - C2	0.024	4.28	0.039	0.90	0.34	0.50	0.48
ASR 190							
T3 - C1	0.006	0.90	0.34	0.67	0.42	0.00	0.99

TABLE 5.5
T-TEST RESULTS FOR H1
HIGH EARNINGS CHANGE PORTFOLIO--CONTROLLED FOR INDUSTRY EFFECT
(Number of shares basis)

Test Period	Mean Value for ITRD		N	Low Shrinkage Portfolio		Difference	t-value	Significance One tailed test
	High Shrinkage Portfolio	N		Low Shrinkage Portfolio	N			
EXPOSURE DRAFT FOR SFAS NO. 33								
T1 - C1	38	0.164	64	-0.041	0.205	1.94	0.028	
T1 - C2	36	0.139	61	-0.033	0.172	1.636	0.052	
FIRST SFAS NO. 33 INFORMATION								
T2 - C1	49	0.125	61	0.018	1.007	1.094	0.135	
T2 - C2	48	0.185	59	0.020	0.165	1.684	0.047	
ASR 190								
T3 - C1	51	0.180	59	0.047	0.130	1.498	0.068	

TABLE 5.6
T-TEST RESULTS FOR H1
LOW EARNINGS CHANGE PORTFOLIO--CONTROLLED FOR INDUSTRY EFFECT
(Number of shares basis)

Test Period	Mean Value for ITRD		N	High Shrinkage Portfolio	Low Shrinkage Portfolio	Difference	t-value	Significance One tailed test
	N	High Shrinkage Portfolio						
EXPOSURE DRAFT FOR SFAS NO. 33								
T1 - C1	63	0.02	50	-0.038	0.058	0.576	0.28	
T1 - C2	61	0.088	49	-0.058	0.146	1.545	0.06	
FIRST SFAS NO. 33 INFORMATION								
T2 - C1	57	0.189	54	0.062	0.251	1.36	0.085	
T2 - C2	53	0.198	52	0.105	0.393	1.095	0.135	
ASR 190								
T3 - C1	60	0.109	56	0.025	0.084	1.201	0.116	

TABLE 5.7
T-TEST RESULTS FOR H1
COMPARISON OF HIGH AND LOW SHRINKAGE PORTFOLIOS--INDUSTRY EFFECT CONTROLLED
(Number of shares basis)

Test Period	Mean Value for ITRD			Difference	t-value	Significance One tailed test
	High Shrinkage Portfolio	N	Low Shrinkage Portfolio			
EXPOSURE DRAFT FOR SFAS NO. 33						
T1 - C1	101	0.074	114 -0.040	0.114	1.58	0.057
T1 - C2	97	0.107	110 -0.44	0.151	2.129	0.017
FIRST SFAS NO. 33 INFORMATION						
T2 - C1	106	0.159	115 0.039	0.120	1.787	0.037
T2 - C2	101	0.192	111 0.060	0.132	2.031	0.021
ASR 190						
T3 - C1	111	0.142	115 0.037	0.105	1.88	0.03

TABLE 5.8
ANOVA RESULTS FOR H1
2 x 2 MODEL--CONTROLLED FOR INDUSTRY EFFECT
(Number of shares basis)

Test Period	R ²	Shrinkage		Earnings Change		Interaction	
		F Value	Significance	F Value	Significance	F Value	Significance
EXPOSURE DRAFT FOR SFAS NO. 33							
T1 - C1	0.021	3.07	0.08	0.58	0.44	0.215	0.78
T1 - C2	0.024	4.70	0.03	0.23	0.63	0.02	0.878
FIRST SFAS NO. 33 INFORMATION							
T2 - C1	0.017	3.22	0.07	0.63	0.42	0.02	0.889
T2 - C2	0.023	4.11	0.04	0.61	0.44	0.30	0.585
ASR 190							
T3 - C1	0.198	3.78	0.05	0.50	0.478	0.13	0.722

TABLE 5.9
NONPARAMETRIC ANOVA RESULTS FOR H1
3 x 2 MODEL--CONTROLLED FOR INDUSTRY EFFECT

PANEL A: MEANS OF ITRD FOR THE INDEPENDENT VARIABLES												
Control Period	Exposure Draft for SFAS No. 33 (July-Dec 78)			First SFAS No. 33 Information (July-Dec 79)			ASR 190 Information (July-Dec 76)					
	Shrinkage	Earnings	Change	Shrinkage	Earnings	Change	Shrinkage	Earnings	Change	Shrinkage	Earnings	Change
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
C1 (July- Dec 75)	H	179.4	H	172.7	H	186.1	H	165.3	H	189.1	H	175.2
	M	172.7	L	165.3	M	174.1	M	174.7	M	161.3	L	164.3
	L	155.9			L	151.4	L		L	160.1		
C2 (July- Dec 81)	H	187.2	H	165.8	H	182.6	H	156.0				
	M	156.8	L	163.4	M	157.1	L	171.9				
	L	153.8			L	154.7						

PANEL B: FRIEDMAN'S ANOVA

Test Period	N	R ²	Shrinkage		Earnings Change		Interaction	
			F Value	Significance	F Value	Significance	F Value	Significance
EXPOSURE DRAFT FOR SFAS NO. 33								
T1 - C1	274	.027	1.44	0.239	0.80	0.37	1.90	0.151
T1 - C2	268	.027	3.39	0.035	0.37	0.54	0.09	0.90
FIRST SFAS NO. 33 INFORMATION								
T2 - C1	279	.023	3.04	0.049	0.49	0.48	0.01	0.99
T2 - C2	272	.033	2.41	0.092	1.41	0.23	1.44	0.23
ASR NO. 190								
T3 - C1	285	.023	2.72	0.067	0.97	0.33	0.05	0.95

TABLE 5.10
T-TEST RESULTS FOR H2
SIZE EFFECT (BASED ON TOTAL ASSETS)
HIGH SHRINKAGE FIRMS--INDUSTRY EFFECT CONTROLLED
(Number of shares basis)

Test Period	Mean ITRD		Difference	t-value	Significance One tailed test
	N	Small Size			
EXPOSURE DRAFT FOR SFAS NO. 33					
T1 - C1	31	0.287	58	-0.030	0.317
T1 - C2	32	0.128	57	0.113	0.015
FIRST SFAS NO. 33 INFORMATION					
T2 - C1	36	0.212	56	0.100	0.112
T2 - C2	35	0.203	54	0.201	0.002
ASR 190					
T3 - C1	40	0.236	57	0.133	0.103
				1.148	0.127

TABLE 5.11
T-TEST RESULTS FOR H2
SIZE EFFECT (BASED ON TOTAL ASSETS)
LOW SHRINKAGE FIRMS--INDUSTRY EFFECT CONTROLLED
(Number of shares basis)

Test Period	Mean ITRD			Difference	t-value	Significance One tailed test	
	N	Small Size	N Large Size				
EXPOSURE DRAFT FOR SFAS NO. 33							
T1 - C1	46	-0.063	46	-0.022	-0.041	-0.4016	0.3445
T1 - C2	47	-0.060	44	-0.117	0.057	0.5593	0.2887
FIRST SFAS NO. 33 INFORMATION							
T2 - C1	47	-0.007	45	0.121	-0.128	-1.2977	0.0989
T2 - C2	43	0.051	46	0.062	-0.011	-0.1046	0.4584
ASR 190							
T3 - C1	47	0.015	42	0.109	-0.094	-1.186	0.1194

TABLE 5.12
RESULTS FOR H2 AND H3--HIGH SHRINKAGE PORTFOLIO
Model: $ITRD = f(\text{Size, Control})$
(Industry effect controlled, Number of shares basis)

<u>ANOVA (2 x 2) MODEL</u>						
Test period	N	R ²	<u>Size</u>		<u>Control</u>	
			F Value	Signif.	F Value	Signif.
T1-C1	66	0.028	1.79	0.185	0.01	0.918
T1-C2	68	0.009	0.20	0.653	0.37	0.543
T2-C1	70	0.035	1.52	0.223	0.90	0.346
T2-C2	69	0.014	0.56	0.456	0.39	0.534
T3-C1	71	0.043	0.15	0.697	2.90	0.093

Means of ITRD for Independent Variables

Test period	Small	Large	Manager	Owner
T1-C1	0.174	0.002	0.072	0.057
T1-C2	0.129	0.159	0.116	0.203
T2-C1	0.232	0.127	0.214	0.084
T2-C2	0.241	0.182	0.232	0.155
T3-C1	0.048	0.154	0.180	-0.018

REGRESSION MODEL

Test period	N	R ²	Size Beta	Control Beta
T1-C1	93	0.004	-0.50 (0.307)	0.19 (0.424)
T1-C2	95	0.032	1.40 (0.307)	1.27 (0.103)
T2-C1	97	0.029	-1.02 (0.155)	-1.48 (0.071)
T2-C2	96	0.002	0.25 (0.401)	-0.32 (0.373)
T3-C1	97	0.057	-1.19 (0.119)	-2.25 (0.013)

TABLE 5.13
RESULTS FOR H2 AND H3--LOW SHRINKAGE PORTFOLIO
Model: $ITRD = f(\text{Size}, \text{Control})$
(Industry effect controlled, Number of shares basis)

<u>ANOVA (2 x 2) MODEL</u>						
Test period	N	R ²	<u>Size</u>		<u>Control</u>	
			F Value	Signif.	F Value	Signif.
T1-C1	80	0.006	0.06	0.814	0.38	0.540
T1-C2	80	0.012	0.19	0.664	0.78	0.381
T2-C1	79	0.003	0.20	0.658	0.00	0.960
T2-C2	80	0.002	0.06	0.803	0.10	0.753
T3-C1	82	0.036	1.89	0.173	1.07	0.305

Means of ITRD for Independent Variables

Test period	Small	Large	Manager	Owner
T1-C1	-0.035	-0.080	-0.090	-0.028
T1-C2	-0.026	-0.110	-0.115	-0.015
T2-C1	0.032	0.073	0.047	0.052
T2-C2	0.062	0.024	0.027	0.061
T3-C1	0.006	0.090	-0.010	0.079

REGRESSION MODEL

Test period	N	R ²	Size Beta	Control Beta
T1-C1	107	0.014	-0.83 (0.204)	0.63 (0.265)
T1-C2	106	0.048	-2.24 (0.014)	-0.19 (0.425)
T2-C1	106	0.001	-0.07 (0.471)	0.34 (0.366)
T2-C2	106	0.023	-1.56 (0.061)	-0.26 (0.398)
T3-C1	107	0.028	1.38 (0.085)	1.37 (0.086)

TABLE 5.14
T-TEST RESULTS FOR H3
OWNERSHIP EFFECT
HIGH SHRINKAGE PORTFOLIO, INDUSTRY EFFECT CONTROLLED
(Number of shares basis)

Test Period	Mean Value for ITRD			Difference	t-value	Significance One tailed test
	N	Manager Control	Owner Control			
EXPOSURE DRAFT FOR SFAS NO. 33						
T1 - C1	42	0.072	0.057	0.015	0.109	0.45
T1 - C2	44	0.116	0.203	-0.087	-0.686	0.245
FIRST SFAS NO. 33 INFORMATION						
T2 - C1	46	0.214	0.084	0.130	0.933	0.175
T2 - C2	46	0.232	0.155	0.077	0.626	0.265
ASR 190						
T3 - C1	45	0.180	-0.018	0.198	1.752	0.04

TABLE 5.15
T-TEST RESULTS FOR H3
OWNERSHIP EFFECT
LOW SHRINKAGE PORTFOLIO, INDUSTRY EFFECT CONTROLLED
(Number of shares basis)

Test Period	Mean Value for ITRD			Difference	t-value	Significance One tailed test
	Manager Control	N	Owner Control			
EXPOSURE DRAFT FOR SFAS NO. 33						
T1 - C1	-0.089	36	-0.027	-0.062	-0.607	.27
T1 - C2	-0.115	38	-0.015	-0.100	-0.877	.19
FIRST SFAS NO. 33 INFORMATION						
T2 - C1	0.047	35	0.052	-0.005	-0.048	.48
T2 - C2	0.026	37	0.060	-0.034	-0.315	.37
ASR NO. 190						
T3 - C1	-0.010	35	0.079	-0.089	-0.987	.16

TABLE 5.16
RESULTS OF SUPPLEMENTARY ANALYSIS

Cells (Shrinkage & Earnings Change)		Manager Opposition	
		Strong	Not Strong
1	Low shrinkage & High earnings change	10	15
2	Low shrinkage & Low earnings change	10	4
3	High shrinkage & High earnings change	27	32
4	High shrinkage & Low earnings change	12	12

CHAPTER VI SUMMARY AND CONCLUSIONS

6.1 Summary

The purpose of this dissertation is to examine a specific economic consequence of the disclosures mandated by SFAS No. 33 (and also ASR 190). Earlier studies based on aggregate stock market (price) reaction to SFAS No. 33 information led only to conflicting results and inconclusive evidence. Therefore, this study attempted to isolate and analyze the reaction of one important segment rather than that of the aggregate stock market. The focus was on the insider managers of the firm who are privy to the information mandated by SFAS No. 33 and the resultant trading in their firms' stock. The primary hypothesis (H1) posits that the degree of shrinkage in historical income due to price level adjustments would be positively associated with the degree of insider selling during the period of private information possession.

The trading behavior of the insiders during the release of the exposure draft and first release of SFAS No. 33 information was compared with their trading behavior during other "no private information" periods. For ASR 190, the comparison was made with only one control period,

that is, one year before the release of the mandated partial replacement cost data. The data were analyzed using univariate t-tests, a (2 x 2) analysis of variance model and a (3 x 2) nonparametric Friedman's procedure. The surprise in annual historical earnings was used as an additional independent variable in the tests. Two bases of trading, number of shares as well as number of transactions during the test and control periods, were examined. This study tested for the reaction of insiders (consequence) and not the effect of reaction (that is, price change).

For almost all the tests, including those for ASR 190, the insider selling behavior is in the hypothesized direction, and most of the tests show statistically significant results supporting the primary hypothesis H1. When the shrinkage ratio was adjusted for industry membership, the results improved somewhat. For all the tests (including ASR 190), the attained significance for the shrinkage variable is at or less than the 9% level (except 3 out of 25 tests). The results, therefore, are consistent with the assertions of the primary hypothesis H1. One possible interpretation of these results is that the mandated SFAS No. 33 introduced new and finer information which led to the unusual stock trading behavior of the company insiders of this study.

The test results for the control variable "surprise in historical cost earnings" are not fully consistent with

expectations. Recollect that this variable was used because of its inclusion in some prior studies on insider trading. However, even in those studies the impact of this variable was not always consistent. Also, in some of these other studies, the measurement of unexpected earnings was based on forecasts made by management, while the measure used in this study was based simply on prior years' actual earnings. The sign (direction) observed for this variable is in the expected direction, but significance levels are not reached. Most of the prior studies used a period of a whole year for the purpose of testing insider trading. In this dissertation the test and control periods are only 6 months' duration before the event date(s). This alignment (of period) problem could also have caused this insignificant result for the earnings change variable.

The primary hypothesis H1 was partitioned into two sub-hypotheses based on the variables firm size (H2) and type of ownership control (H3). In the main t-test for size effect, the direction of insider trading for both sets of SFAS No. 33 tests is positive as hypothesized. In two of the four t-tests, the attained significance in support of the size effect is at conventional levels. Results based on ANOVA and regression models are more or less similar to the t-test results. ASR 190 results are also consistent with H2 (size effect). These tests lend some support for the size effect, which posits that insiders of

small firms were greater net sellers than those of large ones, given a high level of shrinkage of CC/CD income.

Test results for the ownership effect reveal that the magnitude of insider trading (selling) for manager firms is greater than that for owner firms in most of the tests for SFAS No. 33. For ASR 190, the direction of trading is also as expected and the results are significant at conventional levels.

6.2 Limitations

There are a number of problems in making inferences from insider trading as indicated by Larcker et al. (1983). There exists no comprehensive theory of insider trading that specifies the causes and conditions that lead to insider trading. Not much is known regarding when insiders trade and how returns to private information should be measured and analyzed. The absence of a theory thus makes it difficult to interpret insider trading activity. If an accounting change has a theoretically adverse effect, but if the insider trading activity reveals insignificant selling, it can lead to different interpretations, e.g., (1) there are no economic consequences or the effects are "second-order" in magnitude; (2) the economic consequences exist, but restrictions arising from the federal securities laws effectively impede the insider trades; (3) economic

consequences exist, but insiders perceive the future period costs arising from a decrease in the value of their human capital to be greater than their trading gains; (4) economic consequences exist, but insiders are simply incorrect in their assessment of the effects.

In view of the above, if insignificant results are observed, we cannot conclude that the SFAS No. 33 is associated with trivial economic consequences vis-a-vis this particular group of economic agents (insider managers).

If theoretical expectations associated with insider trading are confirmed, as in this study, a number of interpretations can be given. Some of these are:

- (a) economic consequences exist which are not second-order in nature;
- (b) insiders perceive a permanent decline in stock price coincident with but unrelated to the accounting change, and they sell the stock to realize loss for tax purposes;
- (c) no economic consequences exist, but the systematic risk of the firm changes due to causes unrelated to accounting change, and insiders accordingly rebalance their portfolio of securities;
- (d) no economic consequences exist, but insiders are selling shares to exercise options in a time

period which happens to coincide with the introduction of a new accounting standard.

An important limitation relates to the explanatory power of the overall model(s). While the primary variable (shrinkage ratio) is statistically significant in the appropriate direction, the ANOVA and the general linear models used in the statistical analyses exhibit a very low R^2 . Hence the inferences one can draw about the causality of the independent variable(s) can be tenuous at best.

The analysis of insider selling behavior was performed on the basis of the number of shares sold by insiders in relation to their purchases, and thus the ITR was calculated. The intensity of insider belief may have been better captured if the percentage of sales to the total holdings of the insiders had been used in the analysis. Data availability precluded such an analysis.

6.3 Conclusion

This dissertation deals with the controversial issue of accounting disclosures for inflation (and changing prices). Many of the early studies found little or no information content in such disclosures. This study, using "insider trading" methodology, leads to the view that new information introduced through SFAS No. 33 might have led to the insider reaction, i.e., a specific economic consequence.

The problem with most of the studies lies in defining information content. If there is new information, then it should be reflected in the stock price. This was the logic followed in those studies. Price reflects aggregation of beliefs and expectations. Some of the stock market participants might have perceived the information to have a positive effect while others a negative effect. Thus, overall, one might not find a direction either way leading to the conclusion that there is "no new information." Therefore, future research may be directed towards analyzing the reaction of individual segments (including insiders) of the stock market with varying and conflicting beliefs for incremental information content of accounting disclosures rather than depending on the aggregate stock market only.

Another point of interest is that the mandated supplementary information is used not only by stock market participants but by other agencies as well. How do the labor unions, the internal revenue service, lenders, bond holders, etc. view these disclosures? What impact does this statement have on the decisions made by these agencies? Answers to these questions may also help in assessing the information content of SFAS No. 33 and similar accounting disclosures.

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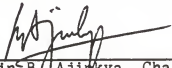
BIOGRAPHICAL SKETCH

Ramasamy Odaiyappa was born on July 14, 1938, in Tamilnadu, India. He received his B.Com. (Hons.) degree from Pachaiyappa's College (University of Madras), India, in 1959, and an M.A. degree in Economics from B.H. University, India, in 1967. From 1959 through 1977, he taught commerce courses in four colleges in the state of Tamilnadu, India.

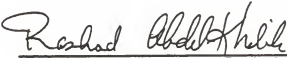
He then came to the U.S. and received his M.B.A. degree with a concentration in accounting from San Diego State University in 1980. While enrolled in the accounting doctoral program at the University of Florida, Ramasamy served as a graduate research/teaching assistant. He will be joining the University of Arkansas as a faculty member starting Fall, 1985.

He is married to Alamelu and has two children, Udayappan and Alamelu.

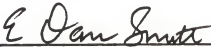
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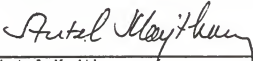
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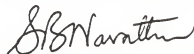
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December, 1985

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